

DCG
DECODER
INSTALLATION
PAGE 74

N scale shelf layout plan



New 4-12-2 in HO tested

November 2009 • www.ModelRailroader.com

Model Railroader®

Two ways to make great-looking trees

Store-bought? Garden plant? Both work!



HOW TO

- Build a laser-cut wood kit
- Kitbash two SD38 diesel locomotives

PLUS

- LED basics for model railroaders
- Guide to track-planning software
- How prototype railroads operate extras

Learn how to make trees like these from natural sedum plants and ground foam. See page 32

\$5.95



Vol. 76 • Issue 11



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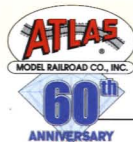


Eight full-width panel body with nine weld seams
Etched metal roof walks, 100-Ton Roller Bearing Trucks
Longitudinal mounted air reservoir
Prototypical hatch and outlet designs

Check out these Paint Schemes!

HO - ACFX (ERS Repaint), Amoco Chemicals, Dupont, Fiber and Plastics Co. (AFPX), Phillips Petroleum, Polysar, Union Tank Car, Westlake Polymers

N - ACFX (ARI-T Repaint), Dow Chemical, Huntsman, Greenbrier, Exxon Chemical Americas, Freeport (ACFX), GE Railcar (PLWX), ADM "Leaf Logo" (Grain Car)



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- TTX

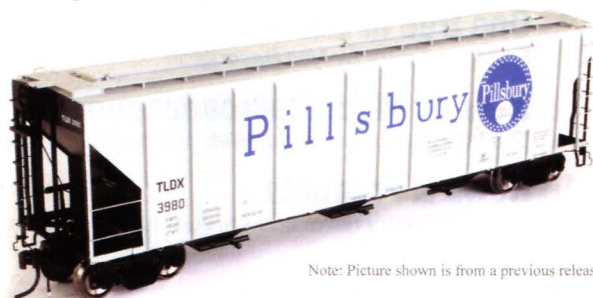
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HO model displayed

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Note: Picture shown is from a previous release

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Dealer Inquiries Welcome

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Number 11



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- Coming next issue:** Need a backdrop for your layout? Next month, the *Model Railroader* staff shows you how build and paint your own.



Buffet Parlor Car and Club Galley: Order by October 15th

This **Pullman-Standard Buffet Parlor** car (shown above) and cars like it entered service over 50 years ago throughout North America to provide all-in-one first class and dining services on routes that did not necessarily require a full-length diner. It is a perfect car for your branchline run or secondary mainline passenger train.

Our Buffet Parlor features an all-new underbody (with separate air, steam and electrical piping), fully painted interior, "Easy-Peasy" battery-powered lighting, Macdonald-Cartier metal couplers, operating diaphragms, etched metal end gates, a reinforced frame, and more. It does not include silverware.

Canadian National (1954 scheme) • Amtrak (Phase 1) • Chicago & North Western • Erie • Grand Trunk Western • Great Northern Gulf, Mobile & Ohio • Milwaukee Road (1950 scheme) • Missouri Pacific (Jenks Blue) • New York Central • Northern Pacific • Undecorated

The **38-Seat Club Galley** (not shown) was a CN rebuild for first-class intercity passenger services. Features separate seats, fully-equipped galley (including Bunn-O-Matic® coffee maker) and more. Available in CN (1954) and VIA. Unfortunately, the Bunn-O-Matic® coffee maker does not include HO scale coffee. Sorry we dropped the ball on that one. Full-size coffee is not recommended.



**Product numbers and car names can be found on our web site.
Reserve with your dealer by the deadline to make sure you don't miss any!**

"Oh, So Steamy!" Steam Generator Car

NEW Paint Schemes! Order by December 1st

The first run of Steam Gennies has been a resounding success, so we are announcing new paint schemes, for delivery next year. Steam Gennies provided steam heat for passenger cars after dieselization meant that there was no longer a guaranteed steam supply. Steam Gennies (also known as heater cars) could be found in countless shapes and sizes. Our model is based on the GM prototype.

The "Oh, So Steamy!" Steam Generator Car features complete underbody piping, working yard lights, working steam effect, a bottle of steam fluid, and a magnetic wand for replacing the cap without getting steam fluid all over the paintwork. Reserve these by the order deadline and that way you won't get all steamed up because you missed them. Ouch. That was an unforgivable pun. Sorry.

Algoma Central • Denver & Rio Grande Western (shown) • Milwaukee Road (1950 Scheme) • New York, Ontario & Western (for the three guys who model it, one of whom works for Rapido) • Ontario Northland • Southern • Western Pacific (California Zephyr)



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RAPIDO

Pre-production models shown. Steam Genny photo is an actual 1-second exposure. Buffet Parlor roof lines and vents not yet added.

From the Editor

One tree at a time

Neil Besougloff, Editor



Scenery defines most model railroads, and trees define most model railroad scenery.

I had plenty of time to compose that fanciful nugget a few months ago while planting 89 trees along a 6-foot-long section of our club layout, the Milwaukee, Racine & Troy. The layout is just 16 inches deep where I was working, but it's 58 inches above the floor, so I was standing on step stool for two-plus hours.

The landforms on that stretch of the MR&T are made from plaster-impregnated gauze, so I had to drill 89 holes using three different sized bits, too.

Most of the trees I planted were fir; some were deciduous. The bulk of the 89 trees were inexpensive background models. I reserved a few pricier, nicely detailed trees for the foreground. We started calling these well-crafted models our "hero trees." Managing editor David Popp came up with the name – "hero" in this case is a movie industry term describing pristine props and costumes. Just a few days ago I heard associate editor Cody Grivno talking about hero trees, so I guess the name is sticking.

The 89 trees, hero and unsung, look fantastic, and they extend our wooded Lake Beulah scene all the way to the recently completed town of Mukwonago (there are a lot of Native American place names on our Wisconsin-centric club layout).

By the way, Mukwonago was on the cover of the June 2009 issue and Lake Beulah's scenery was explained in the Step by Step column in the February 2007 issue. Trees are this month's cover subject; turn to pages 32 and 38 for more.

The 89 trees I planted provided immediate gratification. What had been a stretch of green but otherwise sterile rolling landscape was now, two-plus hours later, a forest.

Completing this missing scenic link also took a reasonable-sized bite out of our ultimate goal to finish the scenery on the sometimes dauntingly large MR&T. The layout pretty much fills up a 28 x 54 foot room.

One bite at a time is the best way to approach scenery construction. Your ultimate goal is to build scenery that your fellow model railroaders envy, but you can only achieve your goal one tree at a time. Over time, the small bites add up. In my case 89 trees in two hours was the finale to 25 feet of completed scenery.

The 89 trees also allow me to apply a new spin (let the groans begin) to an old adage: I now see the forest for the trees.

NEIL BESOUGLOFF

Contributing to *Model Railroader*

We welcome contributions from our readers, including articles, photographs, and prototype drawings. For detailed information on submitting material to MR, contact our editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrmag@mrmag.com. *Model Railroader* assumes no responsibility for the safe return of unsolicited material. We assume unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases, and club news items are contributed gratis.

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NEW How-to videos



Get tracklaying tips from the experts

In *How To Build Realistic Reliable Track*, you'll get 14 stories that will show you how to make your layout look and operate better. In this special issue of *Model Railroader* you'll learn all about track, from superdetailing a turnout to easy wiring techniques. You'll also find three how-to videos at ModelRailroader.com.

In these three bonus videos *Model Railroader* editors show you some of their favorite track tips. Executive editor Andy Sperandio shows you his methods for wiring track and turnouts. Senior editor Jim Hediger gives you an overview of how to use a National Model Railroad Association standards gauge. And managing editor David Popp gives you some tips for working with N scale track.



A link to all three videos is in the Online Extras box on our home page. While there you can also order your copy of *How To Build Realistic Reliable Track*.

Learn History according to Hediger

More than 30 years ago, Jim Hediger began building his influential HO scale Ohio Southern. See vintage photos of this multilevel layout under construction as Jim describes some of the challenges he overcame. He'll also share memories of then-Editor Linn Westcott and legendary layout designer John Armstrong and discuss the impact they had on the Ohio Southern's design.



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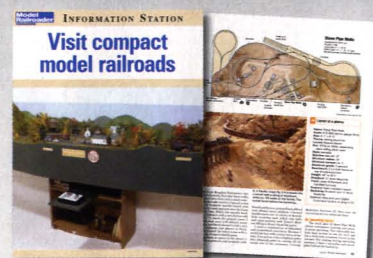
Each week you'll get a modeling tip on subjects from scenery to layout wiring. You'll also get a sneak peek at some of the latest hobby products with associate editor Cody Grivno. Did you miss an episode? There's a convenient interactive index for the entire series. Click on MR Express under the Product and Hobby News tab.



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2857	Highway motel (10/09)...	74.99
2900	Modern roundhouse...	52.5

► Highlighted in this issue

12 Moon Dog Rail Cars Golden West
HO scale three-bay covered hopper
13 Club offerings: gondola, tank car,
drover's caboose, and two calendars

15 Noch flexible grass strips
16 Z scale American Car & Foundry
covered hoppers by American Z Line
16 List of manufacturers

Steven Otte



Ready-to-run N scale cars. In hobby stores now are the latest cars from Micro-Trains Line Co. From left to right are a CSX bay-window caboose, \$29.95; U.S. Army 50-foot troop kitchen car, \$20.35; Kopper's Coke 50-foot gondola with coke container load, \$23.95; and Burlington Northern 40-foot hi-cube boxcar, \$22.55. All the ready-to-run cars come with magnetic knuckle couplers.

Center Flow covered hopper: Atchison, Topeka & Santa Fe; three-pack, \$39.98. 55-ton panel-side twin hopper: Rock Island; \$12.98. United States Railroad Administration 55-ton exterior-post twin hopper: New York Central; three-pack, \$37.98. All models are ready-to-run and have Accumate magnetic knuckle couplers. Accurail

50-foot mechanical refrigerator car. Atchison, Topeka & Santa Fe; Chicago & North Western; Chicago, Burlington & Quincy; Fruit Growers Express; Great Northern; and Pacific Fruit Express. Two car numbers each. Metal wheelsets and McHenry scale magnetic knuckle couplers. \$17.98. Ready-to-Roll. Athearn Trains

American Car & Foundry 89'-4" flatcar. With twin hitches for 45-foot trailers: Southern Ry. and Trailer Train. With pedestals for 20-foot containers: East Carbon Development and Greenbrier Leasing. Four car numbers each; also available undecorated in both styles. Accumate magnetic knuckle couplers. \$32.95 (undecorated, \$27.95). December 2009. Ready-to-run. Master Line series. Atlas Model Railroad Co.

Drop-bottom gondola. Illinois Central, Soo Line, Southern Pacific (composite sides with extensions for beet service, 12 road numbers available), Union Pacific, and Western Pacific. Unless noted, gondolas have steel sides and come in eight car numbers. Metal wheelsets and Kadee magnetic knuckle couplers. \$33.95; SP beet gondola, \$36.95. Spring 2010. Ready-to-run. Inter-Mountain Railway Co.

40-foot flatcar with crate load. Atchison, Topeka & Santa Fe; Illinois Central Gulf; and Reading Co. Metal wheelsets and magnetic knuckle couplers, \$10.99. Ready-to-run. Model Power

United States Railroad Administration 55-ton steel twin hopper. Cleveland, Cincinnati, Chicago and St. Louis ("Big Four," New York Central herald); Chesapeake & Ohio; Clinchfield; New York Central; and Pennsylvania. Also offered in non-prototypical schemes: Baltimore & Ohio; Central RR of Pennsylvania; Chicago & North Western; Denver & Rio Grande Western; Erie RR; Lehigh & New England; Milwaukee Road; Norfolk & Western; Pittsburgh & West Virginia; Union Pacific; and Western Maryland. Metal wheelsets and magnetic knuckle couplers. Individual cars,

\$29.95; six-pack, \$169.95. Ready-to-run. M.T.H. Electric Trains

40-foot wood-side boxcar. Denver & Rio Grande Western; Great Northern; Nickel Plate Road; Rock Island; San Diego & Arizona Eastern; and Spokane, Portland & Seattle. Two car numbers each. Metal wheelsets and McHenry magnetic knuckle couplers. \$16.98. Ready-to-run. Roundhouse

PS-2 2,893-cubic-foot-capacity three-bay covered-hopper. Atlantic Coast Line; Chicago & North Western; Chicago, Burlington & Quincy; Milwaukee Road (one number); Soo Line; and Southern Pacific (one number). Three car numbers each unless noted. Add-on wire grab irons, metal wheelsets, and Proto-Max magnetic knuckle couplers. \$29.98. Ready-to-run. Gold Line series. Wm. K. Walther's Inc.



HO scale EMD SD70ACe diesel. Couplers that operate in Digital Command Control are creating a buzz about this modern diesel from M.T.H. The sound-equipped locomotive is available in 14 paint schemes and has a suggested retail price of \$249.95. MR subscribers can see a video of the couplers operating at ModelRailroader.com.



HO scale American Car & Foundry three-bay Center Flow hopper. This Golden West Service covered hopper from Moon Dog Rail Cars LLC is painted to represent a sun-faded car with patched-

out reporting marks. The car has etched-metal running boards, blackened metal wheelsets, and Kadee magnetic knuckle couplers, and is available in six different car numbers for \$23.99 each.

HO scale passenger cars

New York Central 20th Century Limited passenger cars. Available in 1938 and 1940 paint schemes. Four-double-bedroom, four-compartment, two-drawing room sleeper, \$69.95. Two-sleeper-car set (two differently named sets per paint scheme), \$134.95. Five-car set (includes Railway Post Office-baggage, dormitory-lounge, 17-roomette sleeper, diner, and sleeper-observation), \$329.95. Detailed interiors, separate metal grab irons, and Kadee-compatible magnetic knuckle couplers. Ready-to-run. M.T.H. Electric Trains

Pullman-Standard 10-roomette, 6-double-bedroom sleeping car. Pennsylvania RR (Armour Yellow and Harbor Mist Gray Union Pacific through-service scheme); Penn Central; Richmond, Fredericksburg & Potomac; and Seaboard Coast Line. Flush-fitting windows and doors, sprung diaphragms, and Proto-Max magnetic knuckle couplers. \$44.98. Ready-to-run. Wm. K. Walther Inc.

HO scale structures



Thunder Bay Lumber Co. waterfront sawmill. Laser-cut wood craftsman kit. Grandt Line doors and windows, cedar shake shingles, and peel-and-stick

roofing. Footprint 11" x 29". \$374.95. Sidetrack Laser

Haunted house. Laser-cut wood kit based on a boarding house in Baranga, Mich. Clapboard siding, dentil molding, Grandt Line doors and windows, and peel-and-stick shingles. Footprint 4" x 6". \$160 (plus \$7 shipping and handling). Nick & Nora's Designs



Shell gas station and convenience store. Laser-milled styrene kit. Includes building, canopy, pumps, and signs. Clear acrylic window glazing and self-adhesive decals. Footprint 7½" x 11". \$99.95. Summit USA

HO scale details and accessories

45-foot container three-packs. CMA CGM, Maersk Sealand, Mitsui O.S.K. Lines, NYK Logistics, Orient Overseas Container Line, and P&O. Stacking linkages and separate closure rods. \$29.98 per three-pack. Athearn Trains

HO_{n3} conversion kit for Bachmann General Electric 70-ton diesel locomotive. Kit includes eight half axles, weathered and ready for installation. Instructions not included. \$9.95. NorthWest Short Line

Hopper loads. Wood chip load for ExactRail Gunderson wood-chip hopper. Resin with sawdust

glued on. Two-pack, \$7.95. Resin coal load for BLMA TopGon hoppers. Two-pack, \$5.95. Shipping on direct orders \$6 for up to three packages. Motrak Models

N scale locomotives

Electro-Motive Division F7 diesel locomotives. A and B units sold separately. Alaska RR (three numbers per A unit, one number per B unit); Atchison, Topeka & Santa Fe (yellow and silver warbonnet; three numbers per A unit, two per B); Minneapolis & St. Louis (A unit only, three numbers); Missouri Pacific (Jenks Blue scheme); National Railways of Mexico (three numbers per A unit, B is not numbered); Norfolk & Western (A unit only); Reading RR; and Seaboard Coast Line. Unless noted, four numbers per A unit, three numbers per B. Micro-Trains magnetic knuckle couplers. A unit \$89.95, B unit \$84.95. Spring 2010. Ready-to-run. InterMountain Railway Co.

N scale freight cars

57-foot mechanical refrigerator car. Alaska RR, Nordic Warehouse, Inc. (Cold Train logo), Pacific Fruit Express, Southern Pacific (SPFE reporting marks), and Union Pacific (AMRN or UPFE reporting marks). Separately applied brake wheel, screw-mounted trucks, and truck mounted McHenry scale magnetic knuckle couplers. \$14.98. October 2009. Ready-to-run. Athearn Trains

50-foot double-door boxcar. Chesapeake & Ohio; Delaware &

Club offerings

2010 Northern Pacific calendar. Offered by Northern Pacific Ry. Historical Association (NPRHA). Twelve-month, 8½" x 11" calendar with 13 color and black-and-white photos and important dates in NP history. \$7 plus \$1.50 shipping. Check or money order to: NPRHA calendars, 2599 E. Madison St., Seattle, WA 98112. For information, go to www.nprha.org.

Western Maryland Ry. Historical Society 2010 calendar. \$11 (plus \$2 postage and handling within the United States and Canada). Maryland residents must add \$.66 sales tax each. For foreign postage quotes, e-mail the society at wmrhs1118@comcast.net. Check or money order to: Leo G. Armentrout, 2000 Reese Rd., Westminster, MD 21157.



Missouri Pacific caboose.

Drover caboose or LCL/merchandise drover caboose conversion. American Model Builders laser-cut wood kit offered by Missouri Pacific Historical Society. Laser-scribed sides, tab-and-slot construction, resin steps, and Tichy brake detail parts. \$55.25 plus shipping. With pair of Tahoe Model Works trucks, \$5 extra. Shipping within the United States: \$4.95 per kit, \$10.35 for two to four kits. Shipping outside the United States: \$12.30 per kit, \$18 for two to four kits. Check or money to:

Missouri Pacific Historical Society, 431 Kingwood Circle, Cabot, AR 72023.



Virginian & Ohio 41-foot gondolas. Custom-decorated Accurail car sold by Division 3, Mid-Central Region of the National Model Railroad Association. Oxide red or black, three car numbers each. Available as a kit or ready-to-run. Kit: \$17 each, \$80 per six-pack. Ready-to-run: \$23 each, \$108 per six-pack. Check or money order to: Div. 3 MCR Car Sales, 6493 Anvil Dr., Waynesville, OH 45068. For more information, go to www.modelraildayton.com.



10,000-gallon-capacity tank car. Custom-decorated ready-to-run Red Caboose car sold by the Southeast Region, National Model Railroad Administration. General American Tank Car (GATX reporting marks), four car numbers available. Underbody brake details, metal wheelsets, and magnetic knuckle couplers. \$32 per car; \$110 per four-pack. Add \$6 shipping for one or two cars, \$8 for three or four cars. Optional shipping insurance \$2.25 for one or two cars, \$2.75 for three or four cars. Checks or money orders payable to SER/NMRA to: SER Car Project, c/o Randall Watson, 730 Morning Creek Lane, Suwanee, GA 30024.

86-foot auto-parts boxcars.

Quad-door boxcar: Union Pacific ("Automated Rail Way" slogan). Single car \$27.95, two-pack \$55.90. Double-door boxcar: Central of Georgia and Norfolk & Western. Single car \$24.95, two-pack \$49.90. Etched-metal details and magnetic knuckle couplers. Bluford Shops

Hudson; Elgin, Joliet & Eastern; Penn Central; St. Louis Southwestern (Cotton Belt); and Western Pacific. Two car numbers each; also available undecorated. Accumate magnetic knuckle couplers. \$10.95 (undecorated, \$8.95). November 2009. Ready-to-run. Atlas Model Railroad Co.

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Atlas N

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NY&P, Pickering, Argentine

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With DCC \$119.59

CSX, D&H, MP, ATSF, GATX

New! • **GP38 \$88.69**
With DCC \$115.69

BN, ATSF, TM, PRSL

News&Products

Twin-tub Coal Porter coal gondolas. Canadian National (24 numbers available in two paint schemes). Ready-to-run with Micro-Trains trucks and magnetic knuckle couplers. Single car (two rotary ends), \$24.95; three-pack, \$55.50; four-pack, \$74.95; six-pack, \$111; 10-pack, \$189.95. First quarter 2010. DeLuxe Innovations

73-foot center beam flatcar. BNSF Ry., British Columbia Ry. (opera window beam), Canadian Pacific, Cascade Western (opera window beam), and Trailer Train (open panel beam). Eight car numbers each. Micro-Trains trucks and magnetic knuckle couplers. \$21.95. Spring 2010. Ready-to-run. InterMountain Railway Co.

Nn3 narrow-gauge 30-foot wood boxcar with sliding doors. Southern Pacific. Magnetic knuckle couplers. \$18.40. Ready-to-run. Micro-Trains Line Co.

Five-unit articulated double-stack well car. Trailer Train. Four sets available with new road numbers. Die-cast metal body with plastic details. \$49.98. November 2009. Ready-to-run. Wm. K. Walthers Inc.

N scale passenger cars

Lightweight passenger cars.

Shasta smooth-side coaches: Amtrak (phase 1) and Southern Pacific (*Sunset Limited* scheme). Fluted-side coaches: Amtrak (phase 1), Nickel Plate Road, and Norfolk & Western. Three car names each. Wire grab irons, lighted and detailed interiors, and Micro-Trains trucks and magnetic knuckle couplers. \$33.95. Spring 2010. Ready-to-run. Made by Centralia Car Shops, distributed by InterMountain Railway Co.

N scale details and accessories



Assorted intermodal containers and trailers. Swift 53-foot American Highways trailers (pictured). Two numbers available; \$17.95 each. APL 48-foot smooth-side container, \$16.95 per two-pack. "K" Line 40-foot hi-cube corrugated container, \$34.95 per five-

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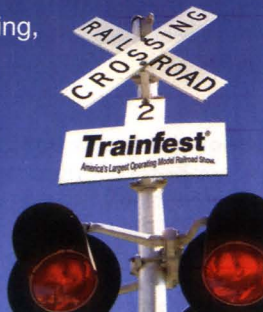
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pack. Sea-Land 40-foot container chassis, \$22.95 per two-pack. First quarter 2010. DeLuxe Innovations

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Figure packs. Hand-painted plastic figures. Five to seven per pack. Traveler's aid (pictured), \$20.99. Passersby (two assortments available), \$15.99. Mine workers, \$18.99. Paul M. Preiser GmbH

O scale locomotives

Electro-Motive Division SD40 diesel locomotive. BNSF Ry.; CP Rail; CSX; Duluth, Winnipeg & Pacific; Illinois Central; and Susquehanna (one road number available). Two numbers per powered version, one number each

unpowered, unless noted; also available undecorated. QSI Digital Command Control with Quantum sound, twin flywheel-equipped motors, and separately applied metal details. \$499.95 (unpowered, \$239.95). Ready-to-run. Atlas O



On2 1/2 Baldwin 4-6-0 steam locomotive with steel cab. East

Flexible grass strips. Scenery maker Noch is offering a series of flexible grass strips in an assortment of spring and summer colors. Suitable for scales from HO to O, the strips are made of synthetic fibers fixed to a clear, flexible glue. Each pack has multiple strips in three lengths and sells for \$18.99.

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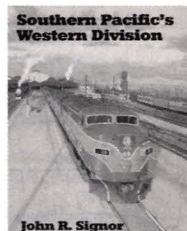
The Sacramento Northern, one of America's greatest interurbans, combined the Northern Electric and Oakland, Antioch & Eastern lines into a 185-mile route between San Francisco and Chico, California. It was later owned by Western Pacific, for whom it was an important feeder. This masterful history by traction and rail authority Harre Demoro superbly documents the history, operations, and essential character of this railroad, including its freight services, in a fine new book.

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50-foot Pullman-Standard PS-1 boxcar. Atchison, Topeka & Santa Fe (*San Francisco Chief* slogan); Atlanta & West Point; Detroit,

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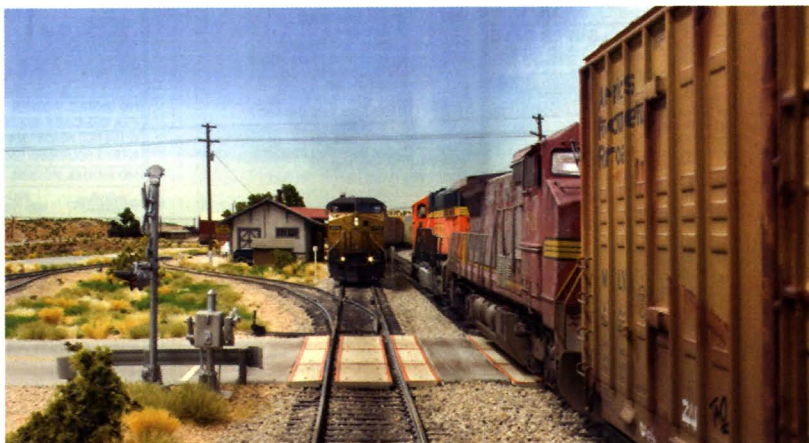
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Eric Stelpflug



Pelle Søbørg gives expert advice on photographing realistic scenes in the September 2009 issue of *Model Railroader*. Pelle Søbørg photo

Picture-perfect

I thought Pelle Søbørg's article, "Make your layout look picture-perfect," published in the September 2009 issue of *Model Railroader* was excellent. I've used most of those methods for years. Eye-level is where we traditionally photograph prototype trains, so why not scale eye-level?

I'd like to add one comment about photo equipment. A feature that I find useful on my new digital camera is a screen that can flip up, flip out, and twist like those found on most new camcorders. This lets me set the camera on or near the rails, and still frame the image easily.

*Bob Hoenes
Marietta, Ga.*

Include unfinished sections

An idea came to me while reading Tony Koester's Trains of Thought column in the August 2009 issue of *Model Railroader*.

He commented that "some of us are more theater majors than engineers." I feel we should be both and give a visitor a "finished" package at the same time.

If your railroad has unfinished track, embellish it instead of ignoring the elephant in the room.

Place some track laying equipment on the roadway, some maintenance-of-way equipment, a crew car, kitchen car, workers, and so forth on the unfinished track.

If you have unfinished scenery, place some excavating equipment like a bulldozer, backhoe, and a dump truck to add life to the scene.

You can even add a hopper of ballast, a flatcar with rails or ties, and some generic personnel.

Don't forget to include the proper construction zone and safety signs. You can even get hard hats for the visitors so they can get the whole effect!

*Gene Smith
Elkhart, Ind.*

Corrections and clarifications

The Soundtraxx Tsunami TSU-KT1000 DCC sound decoder listed on page 16 of the October issue does not require any computer software or downloads. The decoder's correct price is \$119.

The Web site for Dart Castings listed in "Figure painting 101" on page 42 of the October issue should be www.dartcastings.co.uk.

The address listed for Eastern Seaboard Models Corp. on page 18 of the September 2009 issue should be P.O. Box 301, Waldwick, NJ 07463-0301.

In September's DCC Corner column, there's an error in figure 4. The illustration callout should read ".1µF capacitor 50V or more."

Comments, suggestions, and additional information on *Model Railroader* articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to Railway Post Office, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail rpo@mrmag.com. Please include your name, city, and state.

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By 1963, many of the New York Central's switchers had a rotary beacon on the front edge of the cab roof to make them more visible at night. This Norfolk Southern Dash 9-40CW displays the current three-light system with a headlight and two alternately flashing lower lights to capture motorists' attention. Jim Hediger photos

Gumball machines and ditch lights

When did railroads switch from rotary beacons to today's triangular headlight and flashing light display? Were they mainly used in yards or in road service? Were they mandated by federal rules?
Jason Adler, Richland, Wash.

Rotary beacons were initially used in the early 1960s to make switchers more visible in large yards at night. The flashing lights helped the yardmasters in the towers keep track of the switchers.

In the 1970s, the Federal Railroad Administration began studying ways to reduce grade crossing accidents by making trains more visible to motorists. Tests with oscillating headlights, rotating beacons, alternating flashing lights, ditch lights, and roof-mounted strobe lights led to the use of a triangular combination of two strobe lights with a

standard headlight or a pair of roof-mounted strobe lights.

More FRA testing followed in the early 1990s to identify the most effective combination of a normal headlight with various secondary lights. In 1993, a triangular configuration with alternately flashing lower lights was field tested on CalTrans, Conrail, and Norfolk Southern. At the end of the tests, the FRA report lists an accident reduction of 76.4 percent on CalTrans, 74.3 percent on Conrail, and 54.6 percent on Norfolk Southern.

Further experiments compared motorists' recognition of the triangular light system in different spacing combinations. This program also evaluated the costs of installation and maintenance.

These tests were the basis for interim regulatory requirements for locomotive auxiliary lights

issued in 1993 and amended in 1994. These rules included specifications for the auxiliary lights and their positioning on the front of the locomotive.

A final interim rule in 1996 established the current uniform triangular light pattern. The lower lights produce steady beams of bright light during normal train movement, but flash alternately when the horn is sounded, and for 30 seconds afterward. These bright flashing lights mounted close to the motorists' eye level do a good job of attracting attention anytime, day or night.

Using the current version of these auxiliary alerting lights is a matter of the engineer switching them on or off, just like the headlights. From then on, the flashing safety feature is automatic anytime the horn is sounded. — Jim Hediger, senior editor



Each Mega Log Hauler combines two car bodies, coupled with a drawbar, into a high-capacity car that's 120 feet long. David Hickox photo

Mega Log Hauler

Here's an example of a prototype kitbashing project that was done by the Wisconsin Central in 2002. The WC purchased 100 second-hand bulkhead flats from the Southern

Ry., removed one bulkhead from each car, and connected pairs of them with drawbars. Then the cars were fitted with permanent side stakes to secure the load. Named Mega Log Haulers, these two-unit

cars are 120 feet long, ride on four trucks, and carry up to 150 tons of pulpwood logs which are stacked lengthwise for easy handling by overhead cranes.

Even though the WC is now part of the Canadian National, most of these special cars remain assigned to hauling pulpwood for paper mills in northern Wisconsin, so they're seldom seen elsewhere.

More detail photos and information about these unusual cars can be found on Jeff Eggert's Web site: www.yardoffice.com/RR/Freight-Cars/WCMegaLogHaulers/. — J.D.H.

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Information Desk



John Klotz built this HO sand house and storage bin for his York Haven RR featured in the December 1990 *Model Railroader*. Lou Sassi photo

Locomotive sand delivery

I'm building a small 1950s engine terminal. It'll have a drying house and an open storage bin (the Walthers kit) for sand storage. By what means would they get the raw sand from a gondola or a hopper car into the storage bin?

Lars Sjogreen
Copenhagen, Denmark

Locomotives spray dry sand on the rails under the drivers to increase their adhesion, so a fresh supply is needed at service points. For most of the steam and early diesel era, the raw (or "green") sand was delivered to engine terminals in open gondolas or hoppers. Then it was either dumped into a small conveyor or hand shoveled into the open storage bin. Manual labor was cheap and plentiful back then, and the same laborers also hand shoveled the sand into the drying shed and heater.

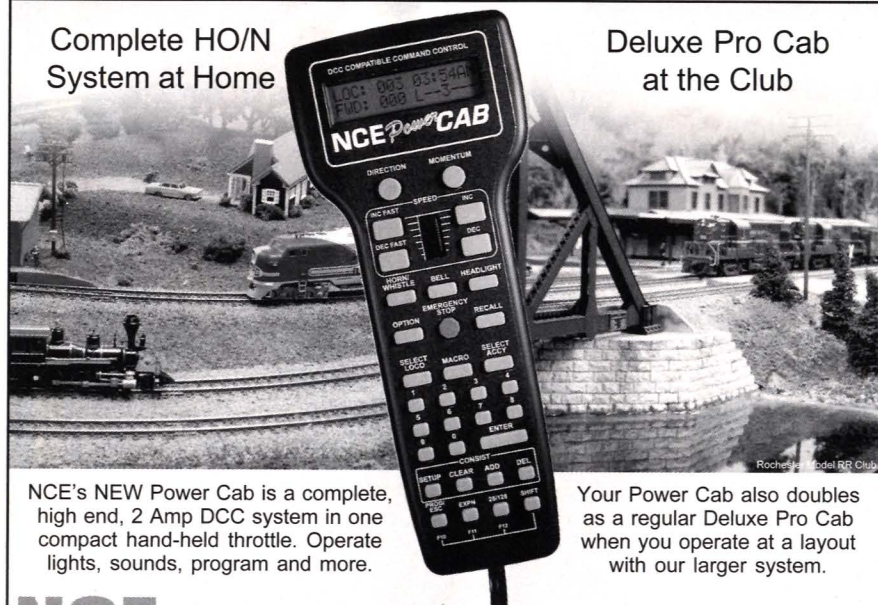
The green sand was then heated in a special stove that removed moisture. Once dry, sand flows easily, and compressed air was used to blow it into overhead bins. Then the dry sand was dispensed by gravity into the locomotives.

More recently, railroads obtain carloads of dry sand in covered hoppers from outside vendors, and many railroads have dedicated sand cars that are fitted with special outlet pipes which can be connected directly into the engine terminal's sand system. Then air pressure blows the dry sand into the overhead bins. — J.D.H.

Send your questions about prototype railroading to Information Desk, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail proto@mrmag.com. We regret we can't answer all the questions we receive.

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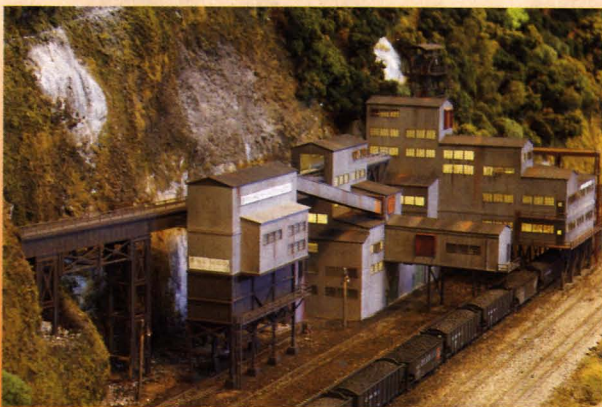
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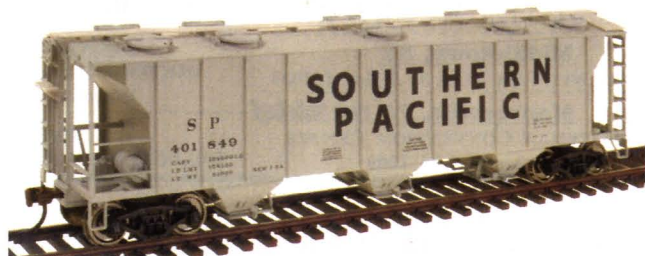
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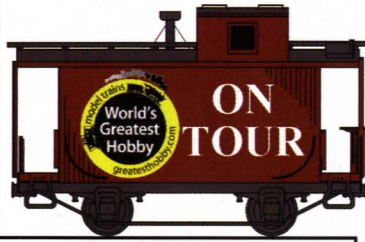
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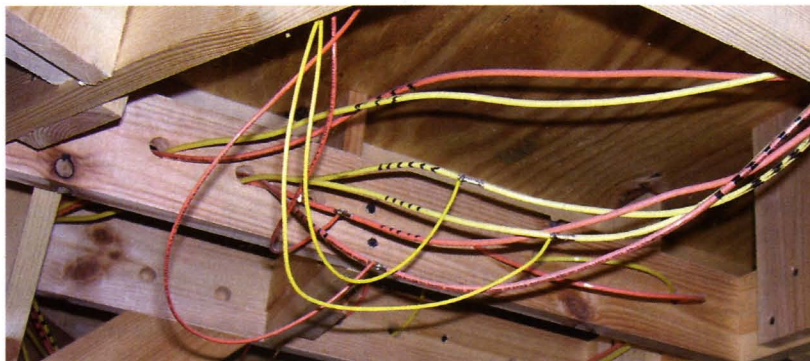
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Workshop

Jim Hediger



Jim McQueeney uses yellow and orange wires for his track feeders and adds stripes with a permanent marker to identify specific circuits.

Color coding for easier wiring maintenance

As a novice to wiring a model railroad, I began by taking a careful look at similar installations on my friends' layouts. My goal was to add the wiring with minimal difficulty. My Digital Command Control (DCC) system's 18AWG stranded track feeders are connected to a pair of heavy 10AWG bus wires. I wanted this wiring to be unique in color, so I chose yellow and orange to make sure it didn't get mixed up with anything else. I use the common red, black, blue, white, and green colors to wire other control components and signals, which makes it easier to trace a wire when maintenance is necessary.

As I worked my way around the layout, I reached three reversing sections that loop around one end of the main yard. Maintaining my yellow and orange color code was easy enough, but I needed a way to distinguish the reversing sections from the main wiring.

My first thought was to apply adhesive-backed wire number tapes, but this seemed like a lot of work and expense.

My solution was to use a permanent marker to add a single black stripe around the bus wire feeding the first reverse section. I repeated this code at the wire's connecting points. I marked the bus wire for the second section with two stripes and the third set with three. The photo above shows typical stripes in another area.

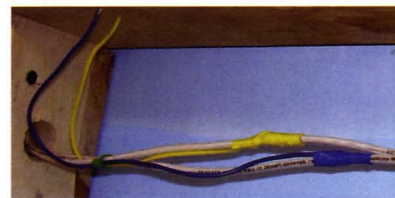
Wiring the standard gauge part of my layout took two 500-foot

spools (one of each color) of the 10AWG and two 500-foot spools of the 18AWG wire. When I expanded my layout by adding an HO_{n3} line a couple of years later, I went to buy more wire and was shocked to find out it had tripled in cost!

Since the narrow gauge line has just 200 feet of track, I found some bargain-priced spools of 18AWG yellow and light blue feeder wire at a garage sale, and bought one new 500-foot spool of white 10AWG wire. I also bought a few rolls of yellow and light blue colored electrical tape.

My preference was to maintain the same wire color coding, but blue was an economical substitute for the original orange.

The photo below shows how I



Jim reduced his wiring cost by using secondhand wire. He added loops of a color coded electrical tape to identify both circuits.

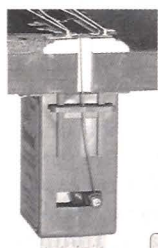
used the white wire for both sides of the narrow gauge bus by color coding them with loops of the blue and yellow electrical tape applied at 10-foot intervals. I also color code the splices during installation. These methods are easy, permanent, and economical. – Jim McQueeney, Rockford, Ill.

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Workshop



Bill DeBuvitz improves performance by using a pair of N scale switchers.

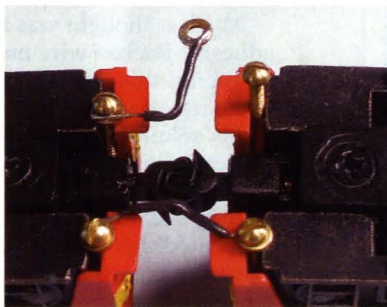
Coupled switchers

Here's is an easy way to improve the operation of a pair of Bachmann N scale Plymouth diesels: permanently couple them cab-to-cab and wire them together. The result is a two-motor switcher that has 12-wheel drive and 12-wheel electrical pickup.

I like to do slow-speed switching, but dirty rails and plastic turnout frogs can cause small diesels to stall. Since I added the jumper wires, these little switchers run smoothly, and I never experience any stalling.

Adding the jumper wires doesn't require any modifications to the locomotives. You don't even have to remove the body shells. As the close-up photo below shows, I ran a 00-90 x 3/16" brass screw up between the shell and the frame on each side of the coupler. These models have split frames, so each half is electrically connected to the wheels on that side. The screws make good electrical contact, since they remove any blackening of the frame as they're driven.

My wire connections are 1/2" lengths of Miniaturics no. 30 gauge stranded ultra-flexible wire soldered to 00-90 brass washers.



Small flexible jumper wires connect this pair of N scale switchers so all 12 drivers pick up current, resulting in smoother operation of both models.

Each wire is just long enough to allow the switchers to travel around curves.

I glued the two Bachmann knuckle couplers together between the units with a drop of cyanoacrylate adhesive (CA) and installed Micro-Trains knuckle couplers on the outer pilots.

The connecting wires are barely visible and look a bit like multiple-unit hoses. However, the clearance between the screws and the rail heads is a bit close, so I made sure the screws were tight against the shell and frame.

This installation isn't permanent, and can be removed at any time if you need to remove the bodies to access the mechanisms.
— Bill DeBuvitz, Mendham, N.J.

Sealing cardstock

You published an excellent article on building realistic cardstock structures in the September 2009 *Model Railroader*. The author's recommendation to use a matte finish to protect the cardstock from moisture and fading is essential. However, I've found that the inks are subject to fading far faster than the enamel or acrylic paints on our other structures. I recommend using a spray such as Krylon UV-Resistant Matte finish (item no. 1309, available in craft stores) to add a degree of extra protection against ink fading rather than a simple matte spray.
— George J. Stein, Wetumpka, Ala.

Workshop will pay \$25 for published tips. Send your modeling and layout-building questions and ideas to Workshop, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail workshop@mrmag.com. We regret we can't answer all the questions we receive. There is no payment for questions; tips are paid for upon publication.

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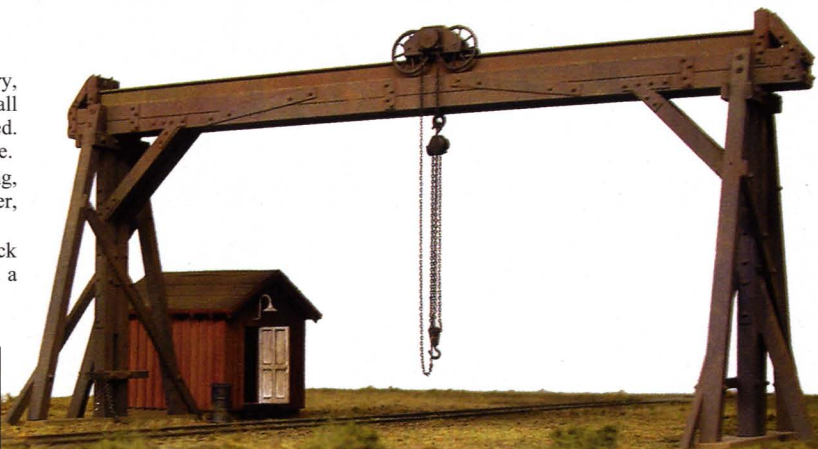
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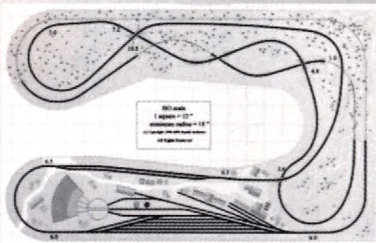
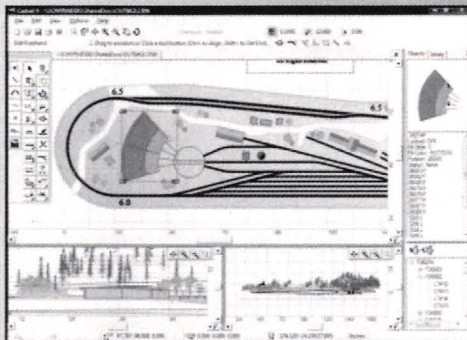
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MAKING TREES

from garden plants



Most model railroads need an assortment of trees. Although there are many commercially available tree models on the market, sometimes it's more fun (and economical) to make your own. Years ago my brother Christopher, who builds architectural models, taught me a technique he uses for making tree armatures from a common garden plant called sedum. I've since made a few refinements to the process, and the result is great-looking foreground model trees.

What is sedum? It's a hardy decorative perennial that will grow in most regions of the United States. There are a number of varieties of this plant, but most produce varying heights and sizes of stalks with dense heads made up of many small pale pink or

purple flowers. Sedum blooms in late summer and through most of the fall, until the first hard freeze. After giving the plants a couple of seasons to establish themselves, you can divide sedum to produce more plants, which in turn produces more trees for your layout.

Admittedly, the very first part of this process, waiting for the sedum to grow, takes a bit longer than most of the other projects you've seen in *Model Railroader*. And, once the sedum has grown, you also have to let it dry for several months before you can use it to make trees.

However, if you don't have the time, space, or inclination to grow your own sedum, scope out your neighborhood for gardens that have the plants. Unless they're fellow modelers, most gardeners



You can make great detailed foreground trees using a natural material called sedum. The inset photo shows what typical sedum plants look like before they send up flowers. Photos by Jim Forbes and David Popp

will let you have their sedum stalks in the fall, after the plants have finished blooming.

The bottom photo shows a bushel basket full of sedum, and that's just a part of last year's crop from my garden. One season's worth of sedum from just three or four healthy plants will make a lot of great-looking trees for your layout.

Step 1 Preparing the sedum for model use

Sedum comes in several varieties, and I have plants that produce large and small flower heads, as shown below. Before you can use the sedum, it must be dried. I typically leave the sedum stalks on the plants in the garden until late fall or early winter. I'll then clip them and leave them in a bushel basket in the garage to finish the drying process.

Dried sedum is brittle, so you need to treat it before you can make trees out of it. To treat the cuttings, fill a plastic container with 1 part matte medium and 4 parts water. After mixing the water and matte medium thoroughly, dip the sedum stalks into the liquid one at a time. Give the sedum 15-20 seconds to soak up the matte medium. Then set the sedum aside to dry.

The stalks will dry straighter if you hang them upside down. As shown in the lower-right photo, I've used a block of 2" foam insulation board to hold the sedum, and then set the block upside down over a 5-gallon bucket. This will protect the delicate flower heads and help the stalks to dry straight.

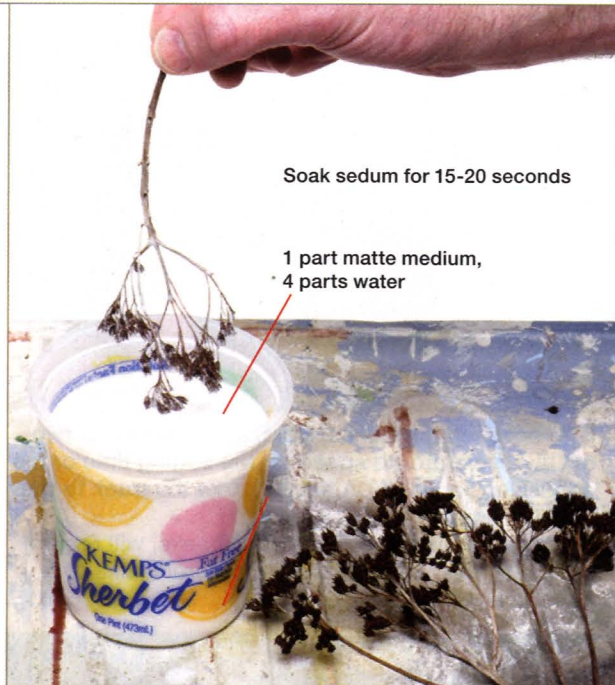
Once treated, the sedum will be more resilient and somewhat flexible, making it easier to use the material without damaging it.

Close-up view of different sizes of sedum



Soak sedum for 15-20 seconds

1 part matte medium,
4 parts water



Bucket catches drips

Poke holes in foam to make it easy to insert stalks



Step 2 Building trees

Small trees, such as fruit trees or saplings, are the simplest types of trees to make because they use a single stalk. Begin by selecting stalks that are straight and have a fairly even flower head. Next, trim the stalk to the preferred height. I use a sharp flush cutter for this step.

The height of your trees will vary depending upon the scale you model. For N scale, I'll use single pieces from 1½" to 3" tall. For HO scale trees you can use pieces up to 5" or more.

At this point, trim any flower heads and branches that may be broken or simply not to your liking. As always, use the trees you see in nature as a guide. Small trees can be fairly uneven, but mid-sized trees have a more full, rounded shape.

You can make bigger, fuller trees by combining two or more stalks of sedum, as shown in the top left photo on page 34. After selecting stalks that will work well together, hold or clamp the ends and then spread a medium thickness cyanoacrylate adhesive

Pick stalks that fit together well



Step by Step

Step 2 Building trees (cont'd)

CA acts as filler



Use accelerator to speed up process

(CA) between the trunks. Next, apply a drop or two of CA accelerator to speed up the setting time of the adhesive. Once the CA has set, trim the trunk to the desired length.

More mature trees, such as old oaks, will require thicker trunks. After combining several stalks of



Caulk used to thicken trunk

sedum to form a larger tree, apply a layer of latex caulk to the trunk to thicken it, as shown in the photo above. Work the caulk around the trunk and form a small flare at the base of the tree. When the caulk dries, use a hobby knife to carve away any parts of the caulk that don't look tree-like.

Step 3 Adding mounting pins

Snips made for cutting steel wire



The trees will need mounting pins. I use modified straight pins for this step. To trim the head from the pin, use a cutter made for steel wire. Also, wear safety goggles and hold the pinhead down and away from you when making the cut.

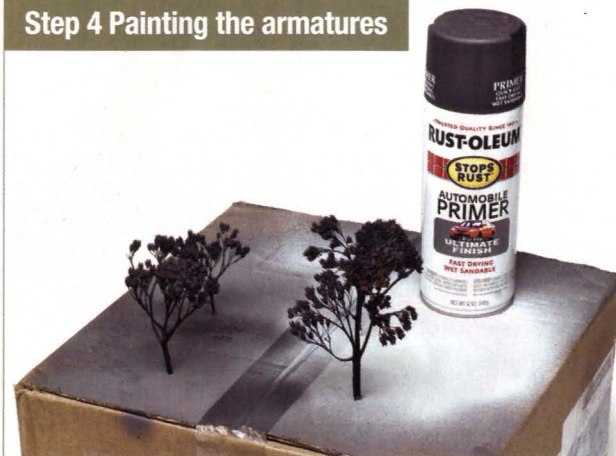
The sedum stalks are hollow, making it fairly easy to install the pins. I start by inserting a regular straight pin



Cement pin in trunk with CA

into the base about a 1/4" to open the hole. Next, I dip the cut end of a modified pin into a drop of CA, and then insert the pin into the hole, as shown above. The pins not only make installing the trees on the layout much easier, but they also give you a convenient handle with which to hold the model trees while you're working on them.

Step 4 Painting the armatures



Before you can cover the tree with foliage, you need to paint it. Although you can airbrush the trees with most any acrylic paint, I like to work quickly, so I use a spray can of Rust-Oleum Dark Gray Auto Primer. The important thing here is that you use a flat-finish paint, so your tree trunks aren't glossy. Don't use brown paint, as most tree bark is a gray color. If you want to make birch or aspen trees, use an off white spray paint instead. You can add the black markings with a small paintbrush or marker later.

To spray the trees, I mount them to a cardboard box. I don't use foam blocks for this step because the organic solvent-based spray paint will dissolve the foam. Be sure to also spray the underside of the seed heads for even coverage.

Step 5 Finally, the leaves

Once the paint has dried, it's finally time to add the leaves. I use various types and colors of ground foam to simulate the leaves on the trees. This is where you'll need to do some shopping, as the grading of ground foam scenery materials varies between manufacturers.

For this example, I used Scenic Express EX805B Grass Green Fine, which in my estimation (particularly since I model in N scale) is actually a medium-coarse ground foam. I also used Woodland Scenics T1349 Green Blend turf, which is much finer.

To add the leaves, I start by dipping the canopy of the tree into white glue diluted 50/50 with water. You can also use diluted matte medium for this step. As shown in the first photo, I use a paintbrush to make sure that the glue evenly covers the underside of the flowerhead. I also use the brush to remove any excess glue from the armature, as too much glue will cause the foam leaves to run down the branches and stick to the trunk of the tree.

Next, I dip the tree into a container partially filled with the medium-coarse (Scenic Express) ground foam. I use this larger ground foam to add some size and airiness to the tree canopy, which also helps to disguise the sedum's flowerhead. As shown in the second photo, I make sure the foam also covers the underside of the flowerhead.

After shaking off the loose foam, I then sprinkle the canopy with Woodland Scenics fine green foam, as shown in the third photo. This does two things for the finished tree. First, the finer foam fills in the gaps left between the pieces of medium-coarse foam, and the lighter color adds sun highlights to the top of the tree, giving the leaf canopy some depth.

Once I'm happy with how the tree looks, I set it aside to dry, as shown in the fourth photo. I then move on to the next one.

You can vary the look of your trees by using different shades of ground foam. Looking at real trees for examples of coloration is always a good idea.

Planting. After the trees have had several hours to dry, I plant them on the layout, placing the best looking ones in the foreground where they are the most visible.

Sedum trees are easy to make, though several of the steps require a day each for the materials to dry. To speed things up, you can make the trees in small batches, assembly-line fashion.

On the first night, soak a small batch of sedum stalks in matte medium and let them dry. The second night, assemble and paint the first batch, but also soak a new batch of sedum. By the third night, you can do all of the steps: soaking, assembling, painting, and finishing. After a week or two of this, you should have plenty of great-looking trees for your layout for a fraction of the cost of ready-made trees or tree kits. So what are you waiting for? Next spring plant some sedum! **MR**

1 Glue



2 Coarse Foam



3 Fine foam



4 Drying



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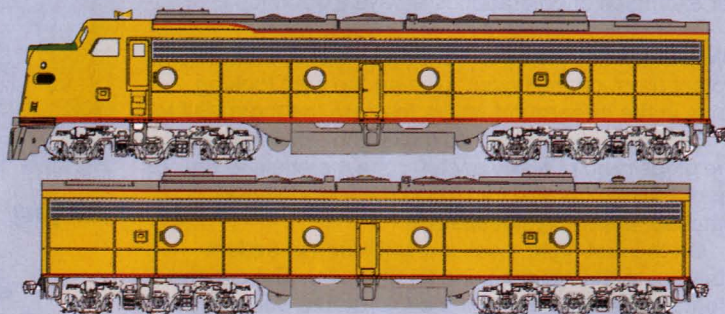
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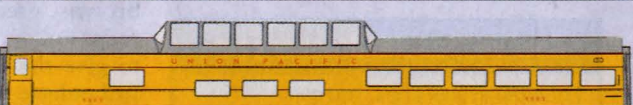
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EASY AUTUMN TREES



Applying acrylic paint washes to loose foliage yields realistic results

By Horst Meier • Photos by the author

Autumn is my favorite time of year and the setting of my HO scale model railroad. Assembled tree models and scenery material are available in several autumn colors, but I've found that using these products straight out of the package doesn't look very realistic. The colors look too uniform, without the variations found in nature.

Now on ModelRailroader.com

For more scenery tips, you can purchase the downloadable article collection *Make your own realistic trees* at www.ModelRailroader.com/InfoStation.



As in the prototype photo (inset), autumn foliage can be found in a wide variety of subtle shades. Using Noch mini-leaves mixed in acrylic paint washes, Horst Meier modeled this realistic autumn setting on his HO scale Union Pacific layout.

I use Heki tree models covered with Noch mini-leaves. Both Heki and Noch are well-known European model scenery manufacturers. Using acrylic paint washes, I can color the foliage of my trees in a seemingly endless variety of browns, greens, oranges, yellows, and reds. Follow along as I show you how to give the foliage on your layout the full palette of realistic autumn colors.

German modeler Horst Meier wrote "Scratchbuilding a rural overpass" in the September 2008 Model Railroader.

Materials list

Heki

301 to 305 assorted small and medium trees

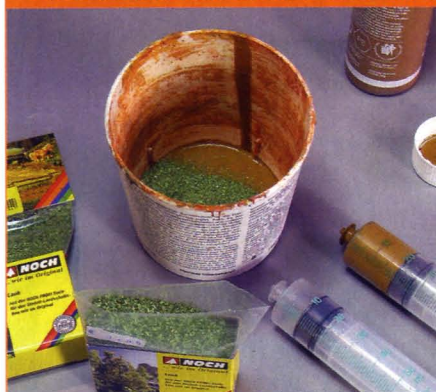
Noch

7140 olive green mini-leaves
7142 light green mini-leaves
7144 medium green mini-leaves
7146 dark green mini-leaves
7148 yellow mini-leaves
7149 red mini-leaves

Miscellaneous

Brown, green, orange, red, and yellow acrylic paints
Clear matte finish spray
Dishwashing liquid

COLORING THE FOLIAGE



Horst adds a package of foliage and the wash to a plastic paint can.

I use six colors of Noch mini-leaves for my trees, including various shades of green as well as red and yellow. You can use all of one color, or for more varied tones, mix the colors together. The final color of the foliage depends on the acrylic paint wash.

For fall foliage, I use brown, orange, red, and yellow acrylic paints. I also use green paint to tone down the red and yellow foliage. I mix a wash of each color, using a ratio of two parts



After closing the lid, Horst shakes the can to apply the wash to the foliage.

paint to one part water. I also add two or three drops of dishwashing liquid to each wash, which helps the color better penetrate the foliage material.

To apply the wash I use a plastic container with a lid. An empty paint can or coffee can also works well. First I put a package of foliage into the container. Then I pour about one ounce of the wash color.

After making sure that the lid is tightly sealed, I vigorously shake the



After spreading them on a box top, he stirs the leaves with a spatula.

container. Next I remove the lid and stir the foliage with a plastic spatula, making sure to scrape the foliage from the bottom of the container. Then I close the lid and shake the container one more time.

You can use a thicker or thinner wash to achieve different effects. For some of my red and yellow leaves I want to only slightly dull the color, so I'll use a brown wash mixed to a ratio of three parts water to one part paint.

APPLYING THE FOLIAGE



First Horst sprays the tree with clear matte finish to adhere the foliage.

After applying the wash, I dump the foliage into a cardboard box lid to dry. I stir the foliage with a plastic spatula, wait 10 minutes, and then stir the foliage again.

I put the dry foliage into a clean plastic container with a lid. I combine colors to make an autumn mix.

I use Heki Super Artline trees for the foreground of my layout and less detailed trees in the background. I apply my autumn foliage mix to both.

First I pour a small amount of my autumn mix foliage onto a sheet of



For a light amount of fall color, he sprinkles autumn mix onto the tree.

white paper on my workbench. On another sheet of paper, I pour out some light green foliage.

Next I spray the tree with clear matte finish, which will adhere the foliage to the tree. [You could use Testor's Dullcote. – Ed.] I roll the background trees only in the autumn mix. For the foreground trees, I roll them in light green foliage, spray them with another light mist of clear matte finish, and then roll them in the autumn mix. The light green foliage results in a more subtle shade.



He rolls some trees in light green foliage followed by autumn mix.

For a small amount of color you could also place the foliage mix in a container with a shaker lid. If you want to add a bit of early autumn color to a tree, simply sprinkle on the appropriately colored foliage.

You can layer as many different colors of foliage as you like. I've found it most effective to mix contrasting shades, such as pale green and orange. Photos of real trees, especially those located along your favorite prototype railroad, are also useful color guides. **MR**



Catch the parade
on the Pennsy



1. An A-B consist of Baldwin DR6-4-20 passenger “Sharks” bring an eastbound mail and express train to a stop at the scratchbuilt Willsburgh Station on Tim Garner’s HO Pennsylvania layout. Tim kitbashed his Pennsy class BP-20 Sharks from Resin Trains body shells with mechanisms made from Life-Like parts.

An HO scale railroad that captures the spirit of railfanning in the 1940s

By Tim Garner • Photos by Lou Sassi

The Pennsylvania Railroad has been my first love since I was old enough to railfan at trackside. I watched my favorite GG1 and E44 electrics in PRR paint pass through Harford County, Md., where I grew up. Later railfan trips took me into central Pennsylvania’s scenic Appalachian region, where I got hooked on the PRR’s Middle Division.

My HO scale Willsburgh Division is designed to capture the atmosphere of that region between 1947 and 1952, but without modeling any specific communities. Thus the layout is essentially a long, double-track loop with a five-track passenger depot, five concealed staging tracks, a single-ended freight yard, and a small engine terminal.

I didn’t have room to model the Middle Division’s usual three- or four-track main line, but my double-track loop is a reasonable compromise. Since I don’t model any specific locations, the layout’s post-World War II time frame allows me to rationalize the operation of almost anything on the Pennsy’s roster of steam and early diesel locomotives. I can also operate passenger equipment painted in either the fancy 1938 Raymond Loewy-designed “Fleet of Modernism” colors or the PRR’s classic three-stripe Tuscan red scheme introduced in 1949.

Railfan country

A look at the track plan reveals that my layout is primarily a stage to showcase my trains. I enjoy building and detailing accurate models and then running and photographing them in realistic settings. In effect, I’m railfanning my own layout.

While I appreciate the enjoyment many modelers get from realistic operation, that’s not for me. Switching trains and running them on schedules seems too much like work when I want to unwind after a busy day. Once I’ve made up a train, I seldom switch its consist other than to change locomotives.

My layout is built nearly four feet tall, so viewers see the models from a lower angle. Plus, I gain more storage space beneath the layout. The double-track loop gives me the longest possible mainline run without resorting to any multiple-deck benchwork.

In two locations I used what John Armstrong called scenic curves. These are wide-radius curves that have slight superelevation to make the passing trains look more realistic.

In July 1994, I moved my family to Marlborough, Mass. My old PRR layout couldn’t be moved and was torn down. Not knowing if I would ever need to move again, I built my current layout in



2. On the high line at Amandale Junction, Electro-Motive Division E7 A-B passenger engines roar by at speed with the PRR's *Trailblazer*, while double-headed Decapods pass in the opposite direction with a long drag freight.



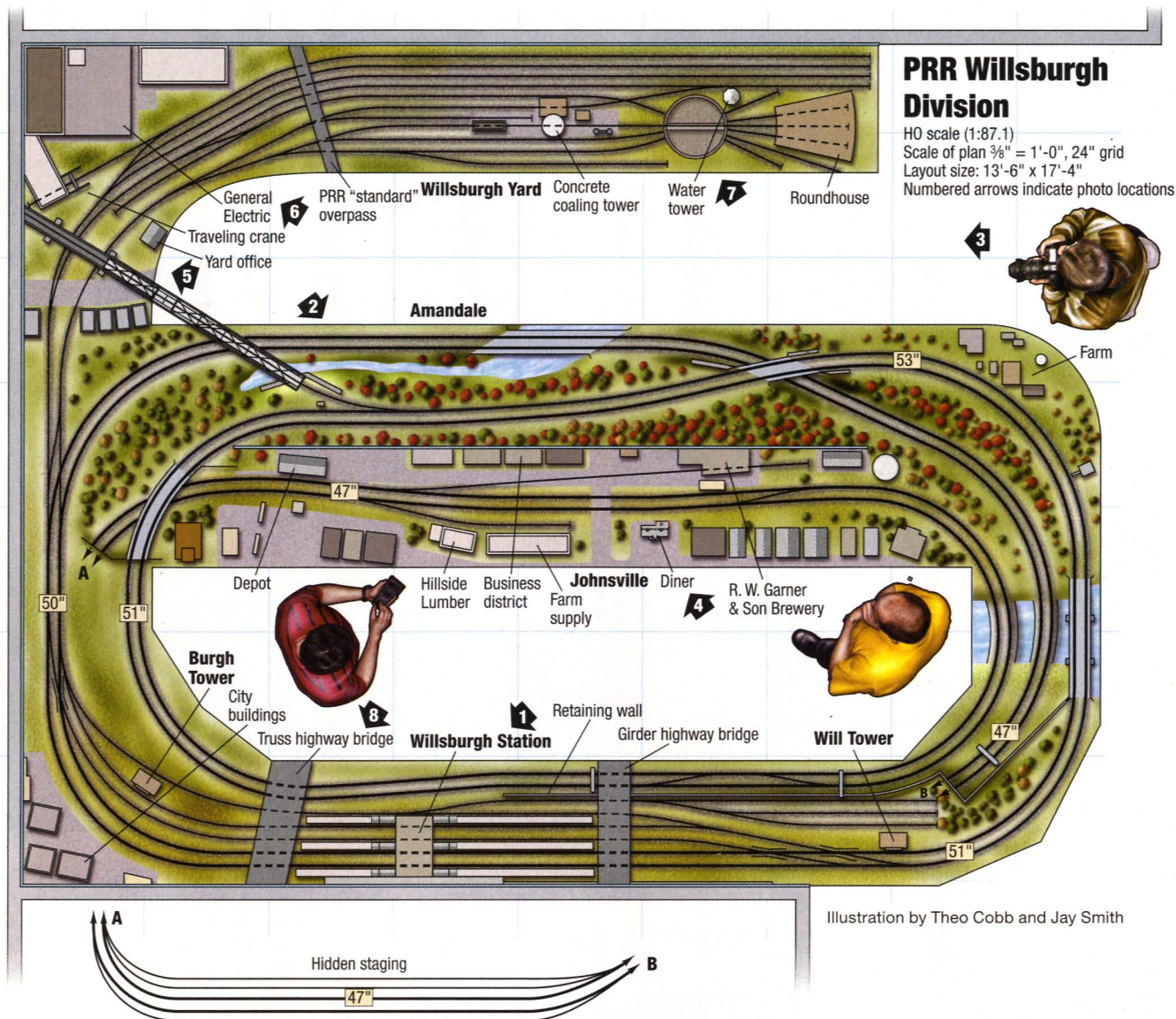
3. This overview shows the fall foliage near Amandale (left) with the Willsburgh freight yard and engine terminal (right). Tim's relatively tall benchwork makes wiring access easier, and provides plenty of storage space below.

portable sections. Each section is two feet deep and three to five feet long. The mainline sections stand on 1 x 2 legs, and the yard area is attached to a wall. Fortunately, I've never had to test the portability of this sectional benchwork.

Lighting and scenery

In retrospect, I would start any future layout by finishing the ceiling and lighting before building the benchwork. My early budget didn't allow for a finished ceiling, so I started out with fluorescent shop lights hanging from the ceiling joists. A few years ago, I installed a drop ceiling and enhanced fluorescent lighting over the layout. This was definitely a challenging project, but it would have been much easier if the railroad wasn't in the way.

I've used most of the common scenery techniques, starting with a plaster base. On top of the plaster, I applied texture with ground foam from several manufacturers, mostly attached with full-strength or diluted white glue. For soil, I've used painted plaster and, most recently, real dirt bonded with acrylic matte medium. In my wooded areas, I used dead leaves from the yard chopped up with water in an old blender – a trick I learned from an article in the November 1995 *Model Railroader*.



PRR Willsburgh Division

HO scale (1:87.1)
Scale of plan $\frac{3}{8}$ " = 1'-0", 24" grid
Layout size: 13'-6" x 17'-4"
Numbered arrows indicate photo locations

Illustration by Theo Cobb and Jay Smith

▶▶ The layout at a glance

Name: Pennsylvania RR,
Willsburgh Division

Scale: HO (1:87.1)

Size: 13'-6" x 17'-4"

Prototype: PRR

Locale: Freelanced from central
Pennsylvania and Baltimore, Md.

Era: 1947-1952

Style: Double-track loop main line
with stub-end terminal

Mainline run: 118 feet

Minimum radius: 26"

Minimum turnout: no. 6

Maximum grade: 2 percent

Benchwork: sectional, open grid
with $\frac{1}{2}$ " plywood subgrade

Height: 47" to 52"

Roadbed: cork (main line) and
Homasote (yard)

Track: Atlas and Shinohara code 100

main line, handlaid code 70 yard
and engine terminal

Scenery: plaster base textured with
ground foam, real dirt, and
commercial trees

Backdrop: handpainted hardboard,
detailed with items cut from
commercial printed backgrounds

Control: NCE Corp. Digital
Command Control

I've also tried a number of techniques for trees, but once I tried Scenic Express Super Trees, nothing else was good enough. One quarter of my layout is set in autumn, my favorite season. I used dozens of brightly colored trees and blended them into a hand painted autumn backdrop. I also painted some Busch corn stalks to represent dried feed corn shortly before harvesting.

The PRR had many weathered stone retaining walls, so I modeled them in two different ways. Most of the straight walls are plaster castings I made from a hand-carved pattern. The curved walls are flexible urethane castings.

The love of bridges

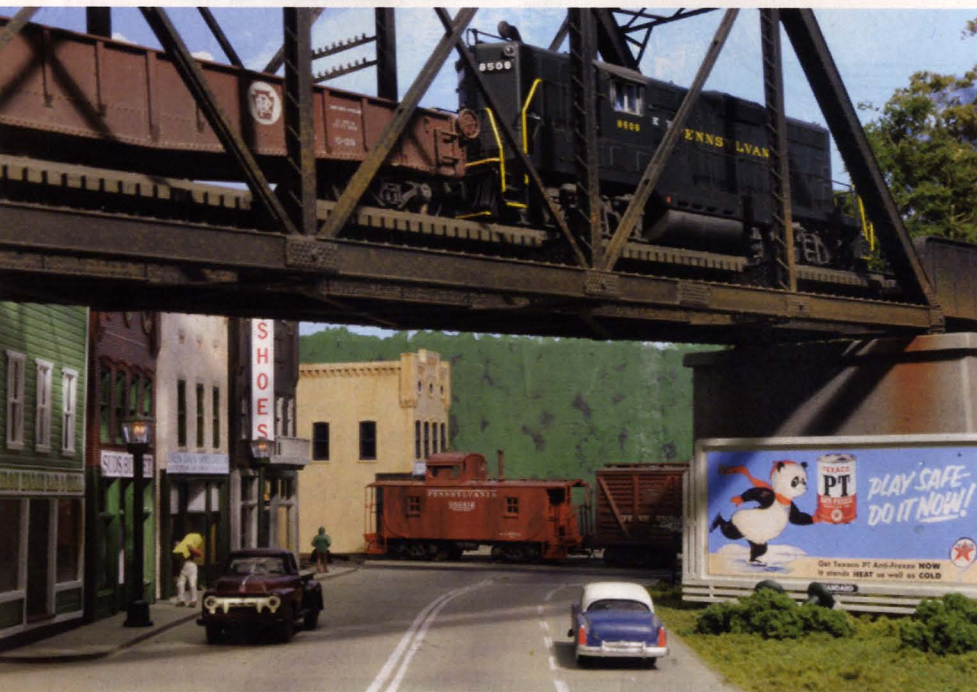
I'm fascinated by the wide variety of bridges used in prototype railroading,

so I've built eight different bridges to carry trains or roads over water and other roads or tracks.

The most impressive is a double-track, three-span stone arch bridge at the front of the layout. It's built of wood coated with a layer of plaster. I carved all of the masonry with a hobby knife and added PRR standard pipe railings along the top.



4. It's 1947 and Pennsy's flagship *Broadway Limited* races through Johnsville, Pa., behind a class T1 Duplex. The T1 is from Broadway Limited Imports, the diner was built from a City Classics kit, and the gates are by N.J. International.



5. A local freight led by a Walthers Proto 2000 GP7 heads north through the truss bridge on the Amandale Branch as it passes over an eastbound freight entering Willsburgh Yard. The truss bridge is a modified Central Valley kit, the billboard is a Blair Line kit, and the business district structures are scratchbuilt or kitbashed from Smalltown U.S.A. plastic kits made by Pikestuff.

A long, skewed truss bridge carries a branch line over a stream, the main line, a road, and the freight yard throat. I made it from two modified Central Valley truss bridges with a shortened CV through plate girder span at one end.

There is also a small two-span concrete bridge carrying two tracks. The rest of the railroad bridges are a mix of deck and through girders with and without ballasted decks.

Two bridges each carry a one-way street and a trolley line over the tracks at opposite ends of the Willsburgh Station. This arrangement is similar to the St. Paul and Charles Street bridges next to Pennsylvania Station in Baltimore. One is a deck girder bridge made from Micro Engineering 85-foot girders with Central Valley lattice girder supports. The other is a single span Pennsylvania truss I built to fit using Central Valley lattice girders and styrene shapes. The pale green color is typical of highway bridges in the Mid-Atlantic states.

My newest addition is the two-span, wood deck, PRR standard design pony-truss highway bridge over my freight yard. I scratchbuilt it from styrene sheet, strips, and shapes based on field research and photographs of prototype bridges in Greensburg, Pa., and Perryville, Md.

Track details and signals

I've modeled PRR's heavy track profile, starting with the cinder subgrade the railroad used beneath the limestone ballast on main lines. I made the 1/2" plywood subroadbed wide enough to accommodate this profile and laid the track on cork roadbed. I applied crushed slate, which I obtained from an old branch line in Pennsylvania, along both sides to simulate the cinder subgrade. Then I added Highball and Woodland Scenics limestone ballast on the main line. My yards and spur tracks are also ballasted with the slate "cinders."

I built the main portion of the layout with Atlas code 100 nickel silver track. Code 100 isn't far off from the scale height of PRR's heaviest 152-pound rail. I weathered the rail, ties, and ballast with Floquil paints applied with an airbrush. I included a dusting of simulated traction sand along the stiffest grades, a common sight that's seldom modeled.

I've also started a long-term project to improve my track detail. This work includes adding joint bars, switch details, and cast frogs in the handlaid track. I'm also adding PRR-style switch stands made by modifying N.J. International Ramapo switch stands.

Using my computer's photo editing software, I made standard PRR whistle posts and NO TRESPASSING signs.

Position light signals say "Pennsy" as much as Tuscan red paint and Belpaire fireboxes. Signal bridges, dwarf signals, relay cases, and numerous other signal details are an essential part of my layout. Instead of building working signals, I chose to model the electrical conduits and hardware on the back of the signal targets.

Structures

The Willsburgh Division's numerous urban structures are a combination of commercial kits, kitbashing, and scratchbuilding. I name the towns, businesses, and streets after family members and my hobby friends.

The downtown passenger station at Willsburgh was inspired by Baltimore's Pennsylvania Station. Its five through tracks and three brick platforms are below street level, and a small three-track yard serves the express company and provides car servicing.

The station is represented by a shallow relief structure with a concourse that has a detailed and lighted interior extending out over the tracks. I used my computer to make the train signs and an arrival board listing arrivals and departures at Harrisburg in 1949.

In typical PRR fashion, interlocking towers protect both ends of the station.



6. One of PRR's massive class J1A 2-10-4s enters Willsburgh Yard with a manifest freight from Pittsburgh. The big engine is a brass import Tim upgraded and painted. He scratchbuilt the yard office from photographs of the prototype in Lewistown, Pa., and made the signs on his computer. The factory in the background was built from a Walther's overhead crane and modular wall system kits.



7. Here's a Pennsylvania class L1s Mikado taking a spin on the Willsburgh Yard turntable before heading west with a local freight. The L1 is a Pacific Fast Mail brass import that Tim upgraded with a Soundtraxx Tsunami sound system.

Will Tower is scratchbuilt from styrene and Tichy window castings and has a detailed interior and lights. It's a slightly narrower version of the prototype Union Junction Tower PRR had in Baltimore. Burgh tower guards the opposite end of the station. It's a model of the same prototype that I scratchbuilt from mat board and paper in the 1980s.

I built one of the oldest buildings in town more than 30 years ago. It holds Tim's Train Shop and the Wendy Sue Cafe, which have interiors. The train shop even has a display layout and a showcase filled with brass locomotives.

The major industry in town is R. W. Garner & Son Brewers, named after my

father. The farm at the front corner of the layout holds special significance. Its structures include reconditioned plastic farm buildings my mother and father built from Revell kits for their Christmas train display in the early 1960s. I enhanced the scene with chickens, livestock, and a Busch cornfield.

More on our Web site

A Lou Sassi photo of Tim Garner's Pennsylvania RR Willsburgh Division is available as our free downloadable computer wallpaper this month. Get it at www.ModelRailroader.com.



8. A pair of Alco PAs lead a limited into Willsburgh Station. Tim scratchbuilt the Pennsylvania truss highway bridge from styrene and Central Valley bridge parts. This area is inspired by the Pennsylvania Station in Baltimore, Md.

Controls and wiring

During the layout's original construction, I wired it for cab control using two Model Rectifier Corp. power packs for the main line and one for the yard and engine terminal, with double-pole, double-throw (DPDT) center-off toggles for cab selection.

In 2005 I installed an NCE Corp. Digital Command Control system simply by removing the feed wires from one power pack and connecting them to the DCC unit. At this point, the MRC power packs control only lights on the layout and the turntable motor.

Engine terminal and freight yard

My original track plan omitted an engine terminal and freight yard. Since I needed more equipment display space, I decided to build a yard with handlaid code 70 track and no. 7 turnouts.

As the yard project progressed, I added the engine terminal, which features a turntable, three-stall roundhouse, water tank, coal and sand tower, and an ash pit. The ash pit is serviced by a Burro crane with a clamshell bucket.

Using styrene strips and structural shapes, I remodeled a Walther's turntable

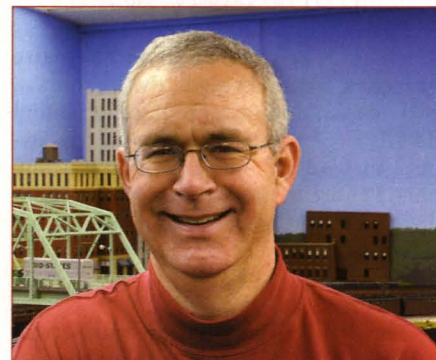
kit into a PRR design with the operator's cab in the center of the table. I used photographs to create my own plans, and the model received Best of Show honors at the 2007 Pennsylvania RR Technical & Historical Society's annual meeting.

The freight yard now accommodates four freight trains, cabin car storage (PRR term for cabooses), and a wreck train. I painted the backdrop to suggest a city skyline similar to the view across PRR's Enola Yard near Harrisburg. My scratchbuilt yard office is based on a building in the Lewistown, Pa. yard.

Enhanced modeling

I enjoy photographing my layout and use the camera as a tool to enhance my modeling. When I enlarge a track-level shot on my computer, it's easy to see deficiencies in the details. It also comes in handy when I need filler for *The East Wind*, the 28-page quarterly magazine I edit for the New England chapter of the PRR Technical & Historical Society.

After 14 years of effort, I've come very close to my original vision for the layout. The remainder of my to-do list is mostly adding lights and details. **MR**



Meet Tim Garner

Tim Garner has loved trains since he was a toddler, built his first layout as a youth, and developed a special interest in the Pennsylvania RR. Tim is secretary of the New England Chapter of the PRR Technical & Historical Society.

After graduating from college, he worked at Life-Like Products. He's now vice president of marketing and strategic planning for a large credit union and serves on the boards of three non-profit organizations. Tim lives in Marlborough, Mass., with his wife Beth, son Will, and daughter Amanda.



Fig. 1 Colors. Fake fur is available in several different colors, so you should be able to find one or two that will work well on your layout.



Fig. 2 Planting weeds. After making several weed tufts, Sergio plants them on the layout in 1/8" holes drilled into the scenery. He uses white glue to secure the tufts.



Fig. 3 Adding detail. Sergio adds detail to the weeds by lightly brushing some of them with acrylic paint.

Sergio Slonecki shows you how to make your own grass tufts using fake fur.

Make realistic weeds

Using fake fur to model tufts of grass

By Sergio Slonecki • Photos by the author

Weeds and tall grasses are some of the most common sights that you see in nature. In my case, I have an HO scale layout that represents southwestern California, and weeds and grass tufts are everywhere.

Silfor makes a product called prairie tufts, which are ready-to-place grass clusters, but if you want to create your own, you can follow my technique. I use fake fur to create realistic looking grass tufts.

Fake fur is available in many colors, as shown in **fig. 1**, and can be found in fabric stores. I was lucky enough to find a natural tan color similar to what you'd see in the desert.

If you can't find a color that matches the scenery on your layout, you can dye the fur to your liking. It's not as easy as dyeing cotton clothes, but you can do it using textile dyes. I recommend trying to find an olive-green or light brown dye. You can make different shades of color by using different amounts of dye.

Before making the tufts, you'll need to make a tool to help form the base of the plant. I bought a paraffin block at an arts and crafts store and drilled a 3/16" deep hole into the block using a 1/8" bit. The hole is used to form the "root" of the grass tuft.

Making tufts

To make a grass tuft, first I cut a small portion of fake fur from the backing and twist one end between my fingers. I then place three to four drops of cyanoacrylate adhesive (CA) into the hole in the wax block and quickly insert the twisted end of the fur into the adhesive. Since the CA bonds quickly, I use gloves to make sure it doesn't get on my hands.

I hold the fur in the CA for a few seconds, then remove it. Don't leave the fibers in the CA for too long or the tuft will adhere to the wax block.

After I pull the tuft out of the hole, I apply a drop of CA accelerator to the base to set the adhesive. I then lay the tuft aside and make another one. After I've made several grass tufts, I use a pair of scissors to trim them.

To plant the weed tufts, I drill 1/8" holes in the scenery, and then as shown in **fig. 2**, I place a drop of white glue into the holes and insert the grass tufts.

I've found that creating clusters of weeds using different colors produces the best results. I also added touches of detail to the grasses using various colors of acrylic paint applied with a soft brush. You can see the subtle differences between the weeds in **fig. 3**.

This same technique also works well if you want to add small bushes to your layout. In this case, add some ground foam to the tufts to represent leaves. To enhance a landscape even more, cover the area with static grass before planting the tufts. The end result looks natural and realistic. **MR**

Sergio Slonecki works as salesman in an electronics shop. He lives in Buenos Aires, Argentina, with his wife, Maria, and their four boys.



Author John Pryke assembled and modified a Branchline Trains laser-cut wood kit to serve as an interlocking tower on his HO scale layout.

How to build a laser-cut wood structure

12 simple steps to construct an authentic HO scale interlocking tower

By John Pryke • Photos by the author

In recent years, structure kits made of molded plastic have been the most commonly used in the hobby. However, kits made of other materials are also available. Of these, wood kits are some of the most popular.

The texture of the unfinished wood components makes craftsman-style kits ideal for modeling wooden structures on a layout. But these kits often require considerable work to complete. Builders must cut, sand, and shape the raw wood to form a structure. Fortunately, laser-cut wood kits are readily available for builders who like the natural look and texture of wood structures but don't have the time or skill required to complete a craftsman kit.

By pairing computer software with precision lasers, kit manufacturers can fabricate the wood parts used to form a laser-cut structure. Using computer-

aided design (CAD) software, manufacturers first develop a pattern for a structure. Computer-guided lasers then use the design to cut thin sheets of wood into the precise kit parts.

Small tabs hold the parts in the sheet until they are ready for use. In some kits, manufacturers coat one side of some parts with an adhesive covered by a protective coating. When it's time to assemble a kit, the builder needs only to cut the tabs, peel away the protective film covering the adhesive, and press the part into place.

Building a laser-cut kit

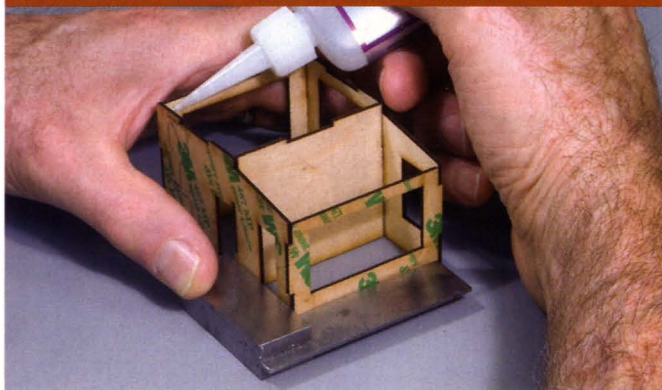
The following photos show how I assembled a simple laser-cut wood kit. I needed an interlocking tower for my main yard, so I chose the HO scale no. 669 Ellinor Tower made by Laser-Art (Branchline Trains).

This 4" x 4" x 4" tower is a model of an Atchison, Topeka & Santa Fe Ry. prototype, which has a large roof overhang. This type of roof isn't found on railroad structures in the eastern United States. However, changing the roof was an opportunity to see how easily I could modify the kit.

The fabrication process isn't difficult, so I'll also share the techniques I used to add a realistic painted finish and install details to the interior and exterior of my tower kit.

John Pryke is a veteran HO scale modeler and prolific Model Railroader magazine author who especially enjoys building structures. Additional insights to his construction techniques can be found in the Kalmbach book Building City Scenery for your Model Railroad (KalmbachBooks.com).

1 ASSEMBLE CORE



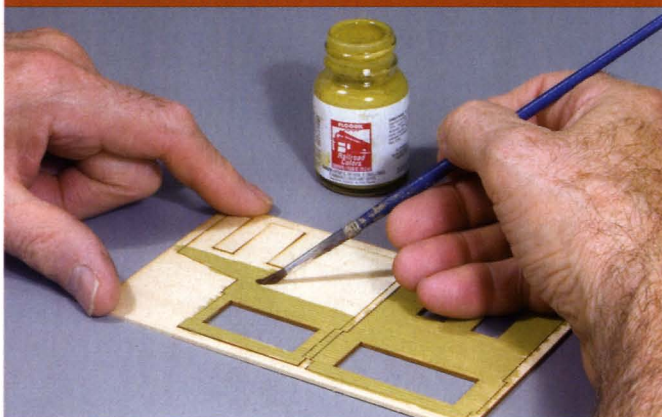
After using a hobby knife to separate the individual parts from the sheet, I began construction by assembling the structure's core. I used a steel square to hold the corners at a 90-degree angle. Then I applied a bead of gap-filling cyanoacrylate adhesive (CA) down each joint, followed by a spray of CA accelerator to speed the curing time.

2 ADD SECOND-STORY FLOORING



Next, I used CA to secure the second-story floor to the core. I made sure the scribed side was facing up before installing the floor. I stained the floor with a wash of 1 part India ink and 9 parts isopropyl alcohol. As the wash dried, the dark coloring settled into the scribing and helped make the individual floorboards more distinct.

3 PAINT EXTERIOR PARTS



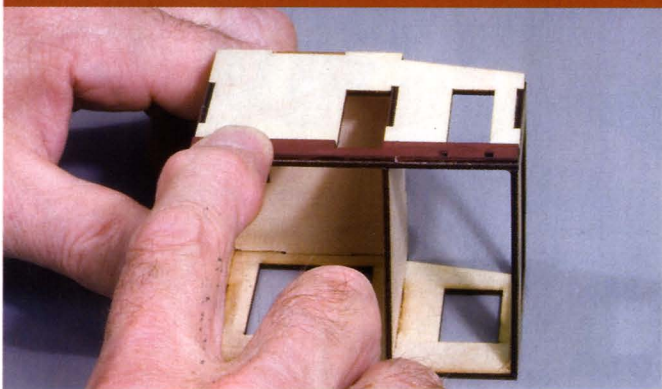
While allowing the core to dry, I painted the exterior parts, including the sides, windows, and trim pieces. During the late 1940s the New Haven painted structures a buff color with brown trim. I used a brush to paint the parts (still attached to the carrier sheet) with Floquil Depot Buff and Floquil Roof Brown. (Prime both sides to prevent warping. – Ed.)

4 TRIM PARTS AND REMOVE BACKING

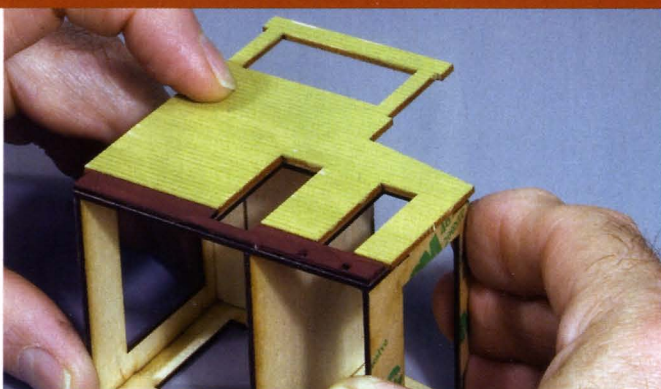


After the painted parts had dried, I used my hobby knife to separate them from the sheets. I use a no. 11 blade to slice through the tabs on thin sheets. On thicker sheets I substituted a no. 2 chisel blade. In preparation for the next step, I used needle-nose pliers to peel the protective backing from the outside of each assembled core part.

5 ADD SIDES

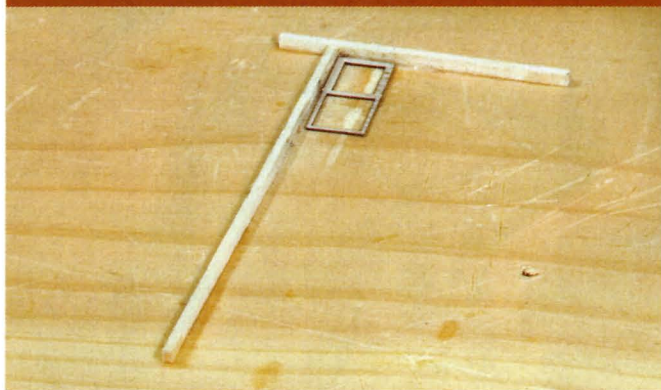


I started by applying the foundation to the core, and then added the sidewall above it. When working with the peel-and-stick parts, I simply remove the backing, align the part over the frame, and then gently press it into place with my



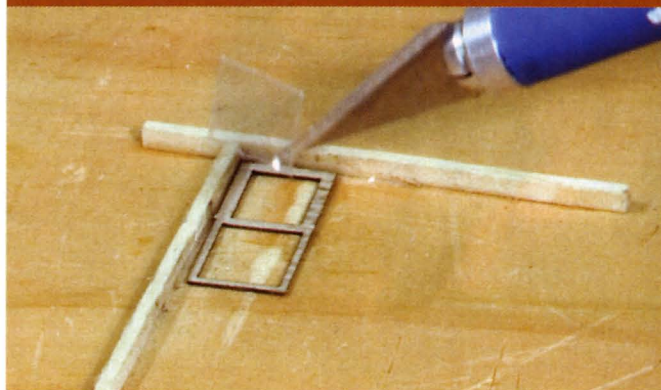
fingers. I never fret if a side isn't properly aligned on the core. I simply insert a hobby knife or razor blade between the parts and lift gently to separate them. I then reposition the part and apply it using the original adhesive backing.

6 FRAMING WINDOWS



To build the windows, I made an assembly jig by cutting $\frac{1}{16}$ " square strip wood into two lengths approximately 3" long, then gluing them together at a 90-degree angle. I placed each window adhesive side up, so its corner fit snugly in the jig. After measuring the window, I used a hobby knife to cut the plastic glazing to the appropriate size.

7 ADD GLAZING



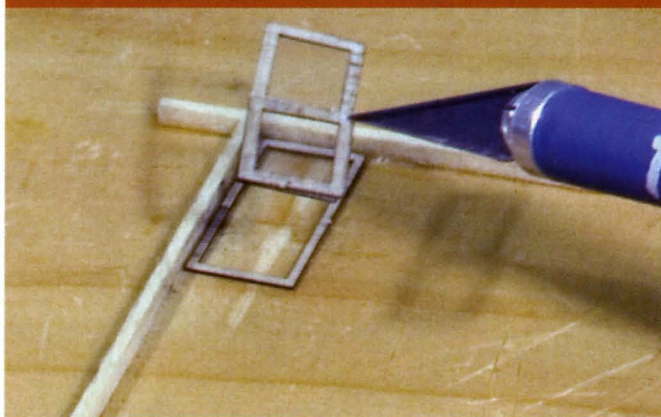
Using the point of a hobby knife to hold the glazing, I could easily see through the material to align it over a window. (I also use the hobby knife this way to handle other window parts.) I then placed the glazing over the upper sash and used a paintbrush to gently press the plastic into place. This avoids marring the surface with scratches or fingerprints.

8 INSTALL SASH



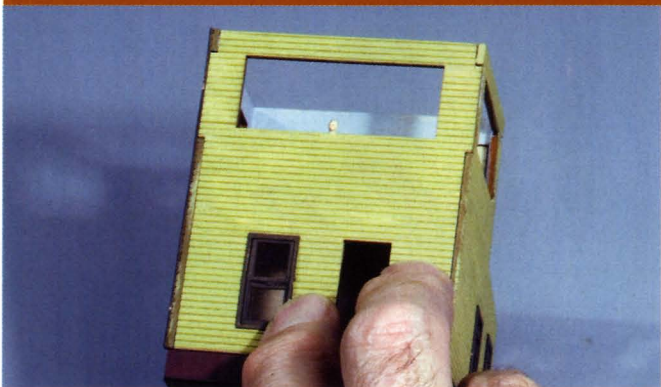
Next, I placed the lower sash in the jig and used CA to secure glazing to it. [A clear-plastic parts cement will also work and reduce the chance of hazing the plastic. – Ed.] I then removed the lower sash from the jig, replaced it with the window, and installed the sash. To make an open window, I attach the lower sash to the upper half of the window.

9 ADD WINDOW TO FRAME



To complete the window assembly, I placed the frame (adhesive side facing up) into the jig. Using the point of a hobby knife again, I picked up the assembled window and placed it in the frame so that a portion of the frame was exposed around the entire window. After assembling these parts, the completed window is ready for installation.

10 INSTALL COMPLETED WINDOWS



To install a completed window, I inserted the assembly through the appropriate opening in the structure's core. After checking the alignment of the window in the opening, I used my fingertips to gently press the window against the edge of



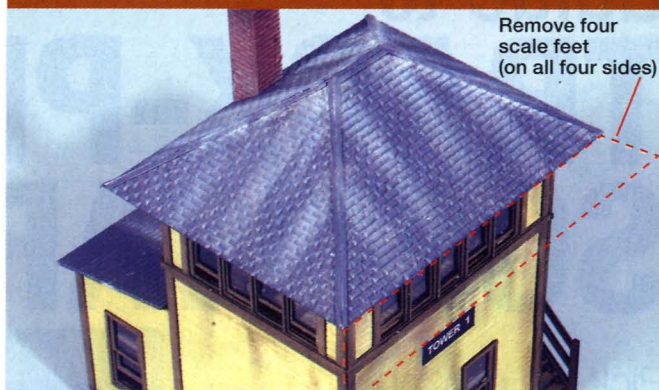
the opening. I repeated this process to install the remaining windows before installing the doors for my interlocking tower. If any of the windows or doors aren't aligned properly, I use a hobby knife to gently remove the part and re-apply it.

11 ADD INTERIOR DETAILS



To fill the exposed tower interior, I made an interlocking machine from a $\frac{1}{4}$ " square piece of wood. Along the top of the wood, I drilled several no. 76 holes and inserted a piece of .020" wire protruding above each hole. Finally, I cemented the assembly to the floor, painted a red knob on each lever, and installed Preiser figures behind the machine.

12 MODIFY THE ROOF



The tower kit is based on a Santa Fe prototype with a large roof overhang. This isn't needed in the northeast United States region I model. I temporarily held the assembled roof parts in place to determine how much of the overhang to remove. I decided that removing $\frac{9}{16}$ " from the edge of each roof panel would yield an appropriate overhang.

ADDITIONAL DETAILS

After completing the tower, I added various details and weathering effects that gave my structure a realistic appearance appropriate for its railyard setting.

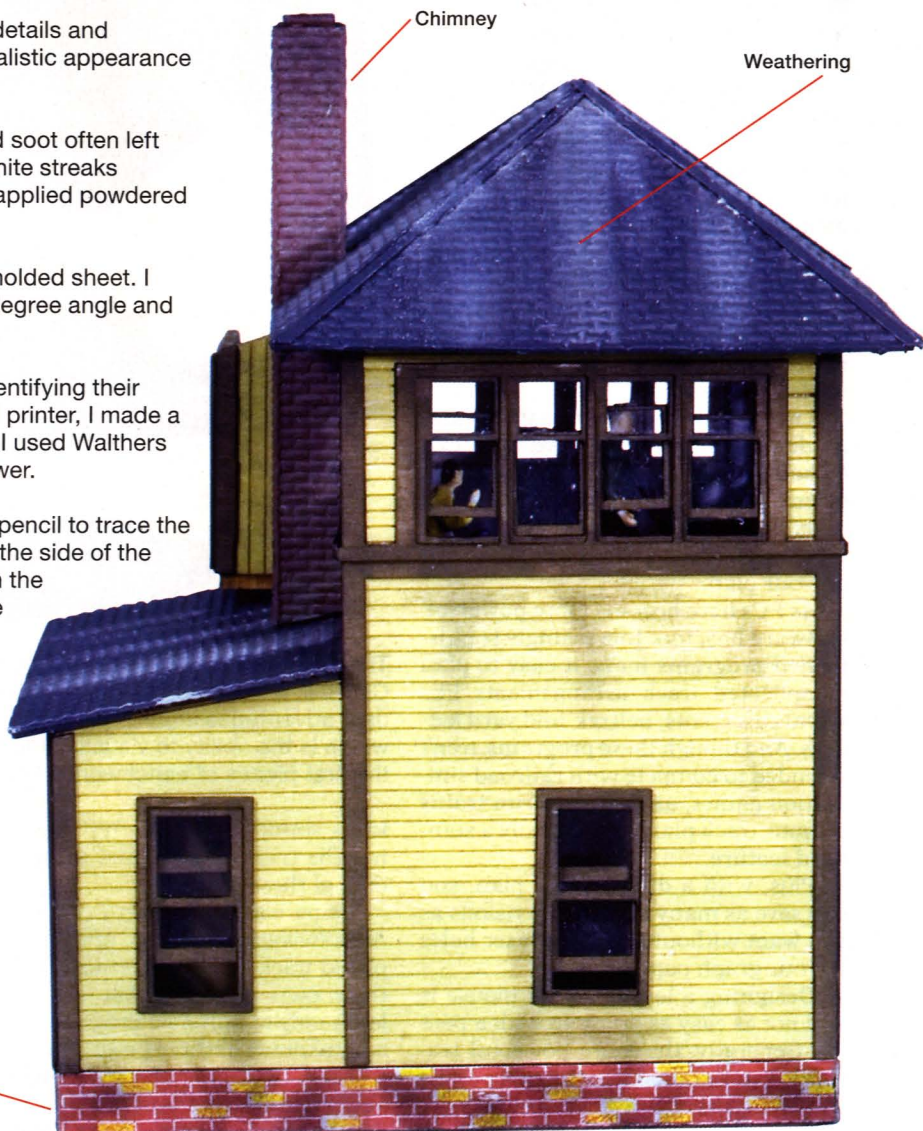
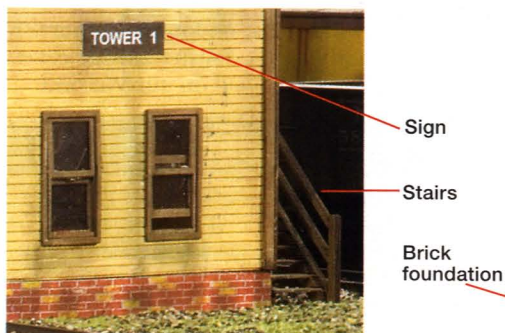
Weathering. Naturally occurring elements and soot often left dark streaks on the walls. The roof also had white streaks caused by bird refuse. To add these effects, I applied powdered pastels using a stiff-bristle paintbrush.

Chimney. I cut four sides from a scrap brick molded sheet. I beveled the inner edges of each side at a 45-degree angle and glued the four sides together to form a square.

Signs. Towers often have signs with names identifying their location on the railroad. Using a computer and printer, I made a sign with white letters on a black background. I used Walther's Goo to cement a paper sign to the front my tower.

Stairs. To add the external staircase, I used a pencil to trace the outline of the outside handrail stringer against the side of the structure. This mark provides a guide to attach the inside stringer so that it will be aligned with the outside stringer and the steps will be level.

Brick foundation. To finish the foundation, I trimmed pieces of HO scale brick paper to cover each side of the structure. I used Walther's Goo to cement the four strips. **MR**



Guide to TRACK-PLANNING SOFTWARE

Pick the package
that's right for you

By Steven Otte

For years, model railroaders have been designing their layouts with paper and pencil. But when computers became common household appliances, it was inevitable that track planning would go digital.

Many modelers still prefer the spontaneity and intuitiveness of sketching on paper. But track-planning software offers advantages no plastic drawing template can, such as automatic alignment of rail joints, a running list of track pieces used, and libraries of components from different manufacturers. You can group, move, copy, and paste track arrangements until you find the perfect place for that passenger yard or engine terminal.

Layout standards such as maximum grades and minimum curve radii can be handled automatically by some programs. Most packages include libraries of commercial structure and bridge kits, making it easy to see what will fit on your plan.

As PCs have become more powerful, software has, too. Increasingly sophisticated programs make it easy to plan complicated track arrangements like spiral easements, helixes, and yard ladders. And though these programs aren't intended to compete with railroad simulation games, an option to run trains on your track plan is practically a standard feature.

Plus, with a digital track plan, you can save as many different revisions as you want without wearing eraser holes in your graph paper.

Designing a layout with a mouse is still not as easy as doing so with a pencil. Generally, the more powerful features a program has, the steeper its learning curve. But if accuracy, flexibility, and ease of testing new layout



This screen shot shows a perspective view of a sample track plan supplied with CadRail, a track-planning computer program. Layout design software gives the user advantages impossible to achieve with pencil and paper, not the least of which is the ability to visualize the layout in three dimensions before putting up the first pieces of benchwork. Photo illustration by Craig Schneider

ideas sound appealing, try downloading the trial versions and sample layouts of these programs.

Some track manufacturers, such as Atlas (www.atlasrr.com), offer free simplified track-planning software keyed to their own products, but this article looks only at universal programs. Here's a breakdown of three programs' prices, features, and ease of use, to help you select the one that best fits your needs. Two more programs – one of which is

still available but no longer supported, and another that doesn't handle elevations – are reviewed on our Web site.

More on our Web site

You can read reviews of two more programs, Abracadata's 3D Railroad Concept and Design and MacRail-Soft's Rail Modeller, on our Web site, www.ModelRailroader.com.

3rd PlanIt

Publisher: El Dorado Software

Web site: trackplanning.com

Price: \$124.95 Internet download,
\$159.90 plus \$10 shipping for
CD and manual

Demo: Limited to 100 objects;
save is disabled

Operating system: Windows

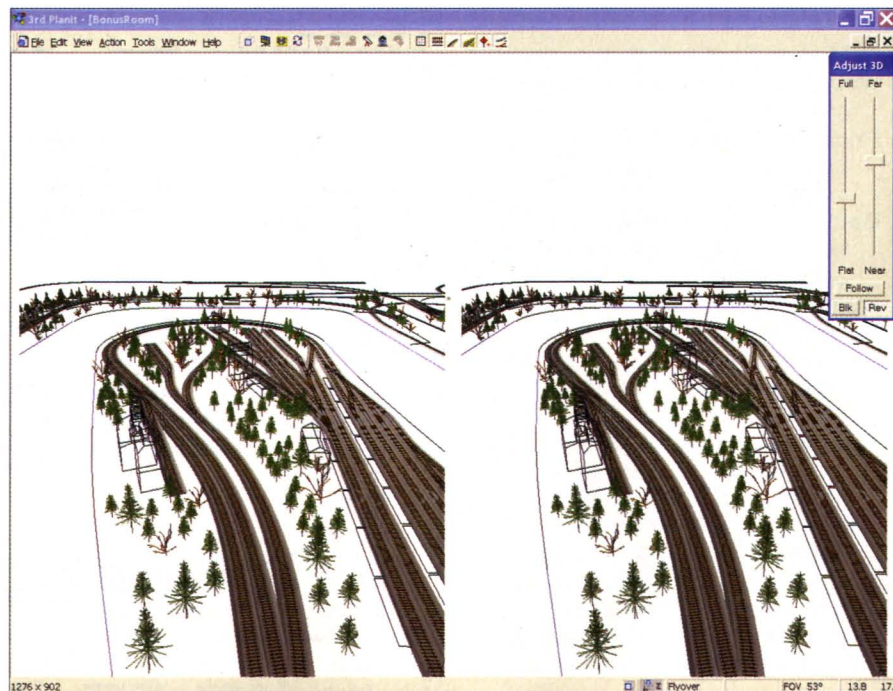
Manual: 174 pages (PDF version
provided with download; can be
downloaded free without
purchase)

Tutorial: Guides the user through
creating an oval sectional layout
with a siding, a double-track
flextrack oval with a small yard,
and a figure-8 with elevation
changes. Also covers setting up
the program's workspace,
drawing free-form track, shaping
basic terrain, adding buildings
and trees, and running a train on
the plan.

Drawing track: Drawing straight track is as simple as click-and-drag, and an assortment of "Connect" tools let you link track segments easily with curves, turnouts, crossovers, and more. In sectional track mode, clicking an object in the library places it in the workspace, attached and aligned to the last item you placed or selected. A keystroke flips or rotates the item if it comes in facing the wrong way. In both sectional and normal modes, track sections automatically align and attach themselves to adjacent items as they are drawn, or with a drag-and-drop.

Drawing easements: Laying out curves in 3rd PlanIt is the job of the Connect tools. Starting from the end of any track piece (straight, turnout, crossing, or sectional curve), you can connect it to any other piece with a constant-radius curve or with easements – either way, it's all one step.

Placing turnouts: Turnouts can be added to a track plan in several ways. In sectional mode, clicking a button places a turnout in the drawing area, attached and aligned to the previous piece of track. In normal mode, clicking the "Draw Turnout" button lets you place a turnout anywhere you click; you designate which type of turnout will be placed by right-clicking on it in the track library. Placing it on an existing piece of straight track will insert the turnout and cut the track to fit. Finally,



A fun feature of 3rd PlanIt is its ability to generate stereoscopic views of a track plan, letting you view it in true 3-D by placing the image at least a foot away and crossing your eyes so the two images merge in the center.

in either mode, clicking the name of a turnout in the library places one in the middle of the screen. It can be attached to an existing track endpoint by dragging it onto the other track so that it highlights, then dropping it.

Building yards: A combination of tools makes this fast and easy. First, draw a single track, whether straight or curved. Next, select it using the "Copy Parallel" tool. Dragging and dropping will create a parallel track following the original, curve for curve; a right-click lets you designate an exact spacing distance. Repeat this to build as many tracks as your yard needs. Place a turnout on the main line where the yard throat will begin. Next, use the "Connect With Turnout" tool to link this turnout to the first yard track, which will be automatically trimmed to fit. Repeat this to build the ladder, and then use the "Connect Without Easement" tool to link the last track to the final turnout.

Handling elevations: Selecting a piece of track, whether freehand or sectional, and clicking a button on the toolbar brings up an elevation dialog with three numbers: height of the start point, height of the end point, and grade. After selecting which of these three you wish to remain fixed, you can edit the other two by typing in a figure.

Drawing a helix: 3rd PlanIt includes a helix tool. Select the tool, click and drag on the workspace, and you'll get what looks like a simple circle of track. By selecting it with the mouse, you can see and edit its properties, such as the radius, separation between levels, grade, and the number of turns. Then, click and drag the helix to another track to align and connect it.

Terrain and scenery: Terrain in 3rd PlanIt is drawn as a mesh, a rectangle of green drawn on a layer under the track. Double-clicking the edge of a mesh opens the mesh editor, in which you can push and pull at the surface to raise or lower hills and mountains. A menu command will then make the mesh conform to the track and structures already on the track plan, automatically creating cuts and fills.

Running trains: 3rd PlanIt comes with a small library of locomotives and cars, which the program treats like any other objects: drag them onto a track, and they snap in place. If you place a locomotive, when you switch to 3-D view, you'll see a throttle window for it. Drag the slider, and the locomotive gains speed. Cars can be coupled and uncoupled on the fly, with sound effects. Clicking on switch stands next to each turnout chooses the route.

Publisher: Sandia Software

Web site: www.sandiasoftware.com

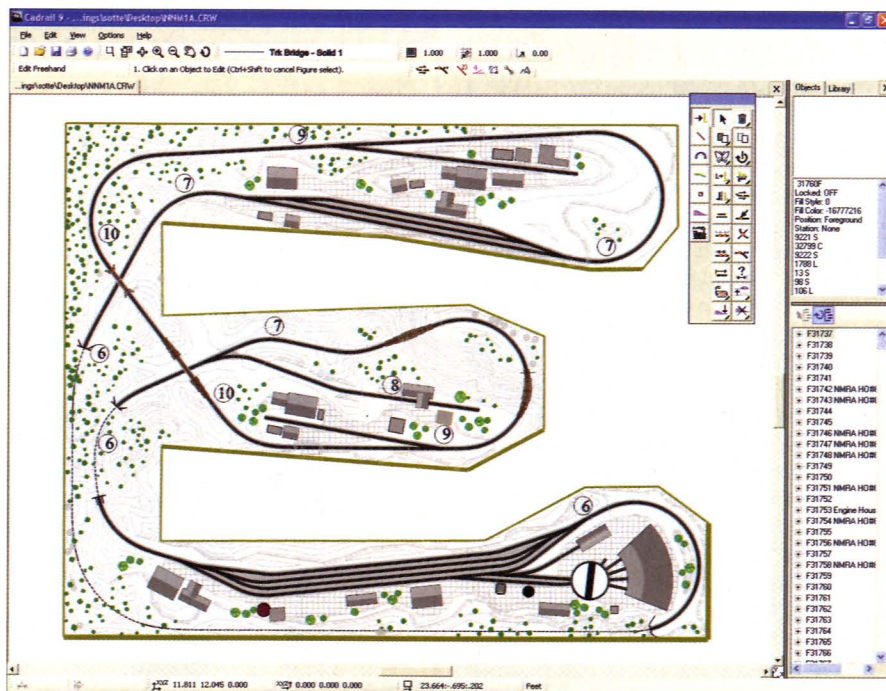
Price: \$59 Internet download;
\$99.95 plus shipping for CD and manual

Demo: Save is limited to 60 objects; larger track plans can be viewed, but not edited

Operating system: Windows

Manual: 184 pages (PDF version provided with download; can be downloaded free without purchase)

Tutorial: Covers basic use of the tools, creating figures, using sectional track pieces, handling elevations, and adding 3-D structures and terrain. Guides the user through creating an oval with an industry spur and a figure 8 with elevation changes.



Drawing track: In Cadrail, CAD – which stands for Computer-Aided Design – comes first. Rather than drawing track, the program draws lines, which can represent track or anything else, such as buildings, trees, and locomotives. Therefore, the program offers lots of different ways to draw and edit lines and groups of lines (called “figures”). Every characteristic of a figure is defined and editable, allowing you to tweak shapes and positions down to the last decimal point.

Placing turnouts: As is the case with most of Cadrail’s functions, there are multiple ways to handle turnouts in this program. Rather than a single tool for turnouts, there are several, each of which has a specialized function, such as inserting a turnout into a track, sliding a turnout along one of its legs, and creating a crossover between parallel tracks. This makes the toolbox look complicated, but it actually simplifies things, since a tool will never do something you don’t expect.

Building yards: This is almost automatic, using one of the figure tools (the tools that look like turnouts). Select a turnout in the object library and place it at the start of your yard throat. Pick the “Yard Builder” tool, then click on a leg of the turnout you just placed. A dialog box will pop up, asking you to specify how many turnouts to place, their spacing, and the length of track to use. Click OK, and the yard appears.

There’s a lot more information in this CadRail track plan than is shown in this view. Every item has its own specifications of size, shape, position, and properties, and the program lets you modify any of them as precisely as you wish.

Drawing easements: Cadrail has several tools for these, depending on what you want the easement to connect to and how. There are tools for drawing them freehand, drawing spirals parallel to existing lines, and connecting every possible combination of curves and straight lines, either with a spiral or with an arc of set radius in the middle.

Handling elevations: The program’s “Stations and Elevations” dialog lets you alter the elevations of a line’s endpoints, assigning it a grade. As you add new track pieces to your plan, they align themselves vertically as well as horizontally, making it simple to keep all your track on the same level. But if you alter the elevation or grade of a figure you’ve already drawn, others connected to it won’t move with it unless they’re grouped, so it’s best to assign elevations as you go rather than planning to do it later.

Drawing a helix: This isn’t as simple in Cadrail as in 3rd PlanIt. The manual directs you to start by drawing two matching 180-degree arcs of track, then duplicating them for the number of turns you want. After defining the arcs as a single figure, move them together to connect the ends, and edit their properties to assign the grade and endpoint elevations you want.

Terrain and scenery: This program concerns itself mostly with track, structures, and similar objects. In 3-D view, terrain is filled in automatically below layout objects, looking kind of like a curtain broadening out diagonally from under your track and structures. You can change the color of this terrain, but you can’t edit its shape. To add basic terrain under your entire layout, create a shape marking the edges of the benchmark, and the program fills it in. You can also create and edit figures to represent hills and mountains.

Running trains: Cadrail calls this part of the program “Runrail.” Clicking the appropriate button in the toolbar opens a group of Runrail controls. You can place and run trains in normal view, edit their consists, and even alter default dimensions such as car width and length to match your rolling stock. Runrail is also useful to find track joints that may look aligned, but really aren’t.

Other notes: One of Cadrail’s most useful features is the three boxes that mark a line’s end point. Each lets you move or resize the object differently. One moves the point freely, reshaping the object to suit; another pivots the object around its other endpoint; and the third extends the line or arc without changing its shape or initial position.

Publisher: DRail Modelspoor Software

Web site: anyrail.com

Price: \$55

Demo: Limited to 50 track segments

Operating system: Windows 2000, XP, or Vista

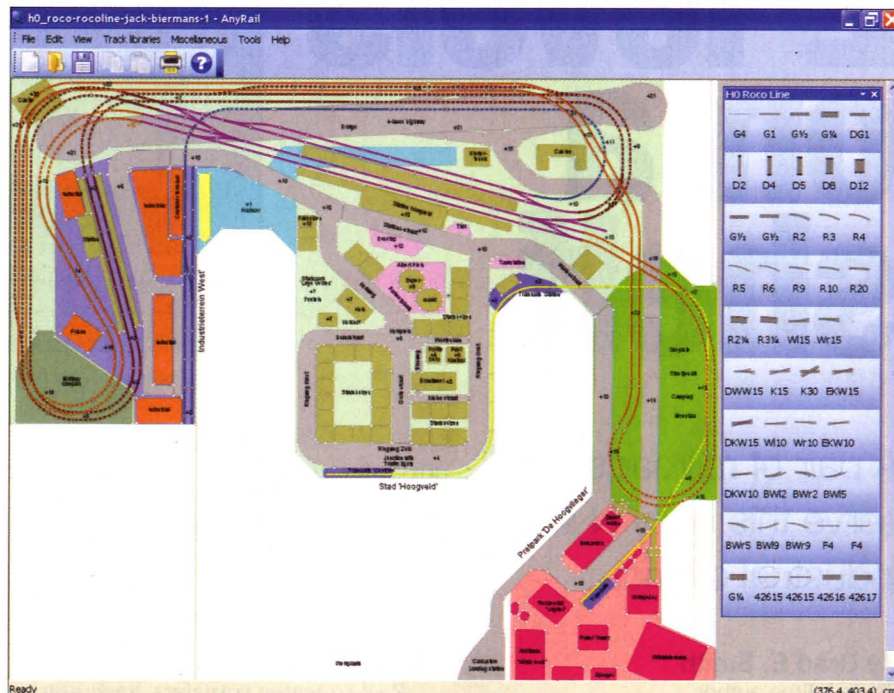
Manual: 72 pages, PDF format. Downloads free with demo. Also available online in HTML format at http://www.anyrail.com/help_en/index.html.

Tutorial: Two pages on the Web site cover setting up the workspace, switching to English measurements (the program defaults to metric), and creating two sample layouts using sectional and flextrack.

Drawing track: Track is created by dragging elements out of a library. Segments snap into alignment when their endpoints are overlapped (you can tell you have the segments in the right place when the track segment highlights). This would seem to favor sectional building, and indeed, most of the sample layouts on the Web site seem to rely on sectional curves. However, you can use flextrack, which can be stretched to any length and reshaped using handles that extend from the track's endpoints. By repositioning these control points, you can bend the track like the real thing. Though it's possible to design curves tighter than any locomotive could navigate, the program helps you avoid this by highlighting curves that are below a minimum radius you set.

Placing turnouts: Turnouts are placed by dragging them out of your chosen track library. Though there are dozens of libraries to choose from in multiple scales, there is no provision for building or modifying custom turnouts.

Building yards: There is no built-in function for making yards. Instead, snap the desired turnouts together in a yard ladder, then add straight or curved track segments. Missing from the program, also, is a way to simplify this by creating parallel tracks or aligning them a set distance from each other. Using identical turnouts in your yard ladder will keep most of your track segments spaced properly, but you'll have to align the last one by eye.



AnyRail has a large selection of track libraries in many scales, including TT and OO, making it most useful for those modeling European prototypes. Its selection of structures and scenery is skimpy, though, and it doesn't support 3-D.

Drawing easements: Simply snapping both ends of a section of flextrack to two track elements (such as a straight and a curve) will automatically create a gentle, natural curve between the two. If your plan calls for a specific easement curve, though, you can create one by right-clicking on a section of flextrack, selecting "Adjust Flex. . . Easement Flex," and specifying both the angle and the curve radius. The track will be modified to match, and you can then snap it into place.

Handling elevations: You can set the elevation at the junction of any two track sections by right-clicking the joint and selecting "Set Height." Since the program treats all track that's joined together as a unit, you have the option to move all other connected track to the new height or create a grade from that point to the next fixed point. You can set a height and a maximum grade, but if your guess for one of those figures is off, the program won't warn you. If it encounters no fixed points, it will raise all connected track to match the new height. If you have locked the height of a connected piece, though, it will ignore your limit. My attempt to use a 2 percent grade to raise a stretch of sectional track two inches resulted in four segments with a 2 percent grade and one at 17.8 percent.

Drawing a helix: It's possible, though cumbersome. First, place a piece of flextrack, right-click it, and choose "Adjust Flex. . . Curve Flex" to change it to a 90-degree curve (the maximum) at your selected radius. Connect temporary tracks to both ends so you can set its grade, then disconnect and delete the temporary tracks. Copy, paste, and join together as many of your curves as you need to build your helix.

Terrain and scenery: The program includes a small library of landscaping symbols (four shapes of trees in several shades) and an assortment of Walthers HO scale structures that can be placed on a track plan. If you're looking for some other shape, though, you have to draw it yourself, using a rather counter-intuitive point-by-point method. The tool isn't even in one of the program's menus or toolbars; you have to right-click on a blank section of the layout and select "Add Line/Surface." Drawing a simple rectangle with this tool takes a minimum of 11 clicks.

Running trains: The program doesn't support running trains.

Other notes: AnyRail doesn't have an option to view track plans in 3-D, making some features like bridges and helixes difficult to visualize. **MR**

2 levels on a shelf

A pair of railroads
serve this busy N scale
industrial district

By Brad E. Smith

Photo by the author

Mainline operations held my interest for many years, but lately I've found that switching has become the most satisfying and downright fun part of my model railroading. With that in mind, I designed and have begun construction of a small N scale railroad that provides as much realistic switching activity as possible in my limited space. The plan I came up with can easily be expanded for use in other scales.

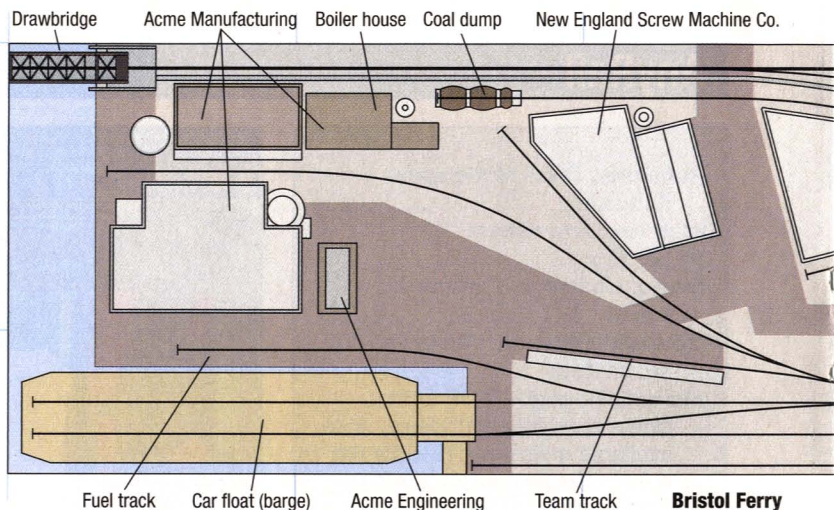
The N scale layout is 18" wide and eight feet long, a size that's manageable for construction and still portable. I used a conservative approach to design

an industrial district that looks busy without becoming too cluttered. Filling the space with industrial spurs and railroad structures maximized my operating potential, but I had to forego most of the scenery and city buildings.

Feature choices

Rail-to-water transfers have always intrigued me, so the car float provides a way to introduce new freight cars onto the railroad. The barge serves as a fiddle yard, so other cars from my collection can cycle on and off the railroad between operating sessions.

For added interest, I included two different railroads that interchange cars via the steep ramp track. This allows me to include both of my favorite railroads, the New York, New Haven & Hartford and the Boston & Maine. My choice of prototypes naturally led to a New England setting for the layout.



I wanted one industry per siding, with an emphasis on large textile mill and factory buildings. I know multiple small customers sometimes share a siding, but they aren't very common around larger industries. However, one location combines a team track and a bulk cement transfer system similar to one I remember from my youth.

Full-size planning

My Bristol Ferry Terminal RR plan is based on the HO scale Iron Mountain Line that was published in the July 1967 *Model Railroader*. The IML provided the basic idea that I revised and adjusted the proportion for N scale.

As the plan took shape, I transferred it to a full size sheet of paper so I could



Brad Smith's N scale Bristol Ferry RR track plan calls for two levels connected with a steep grade, typical of many interchange locations in New England's rolling countryside.

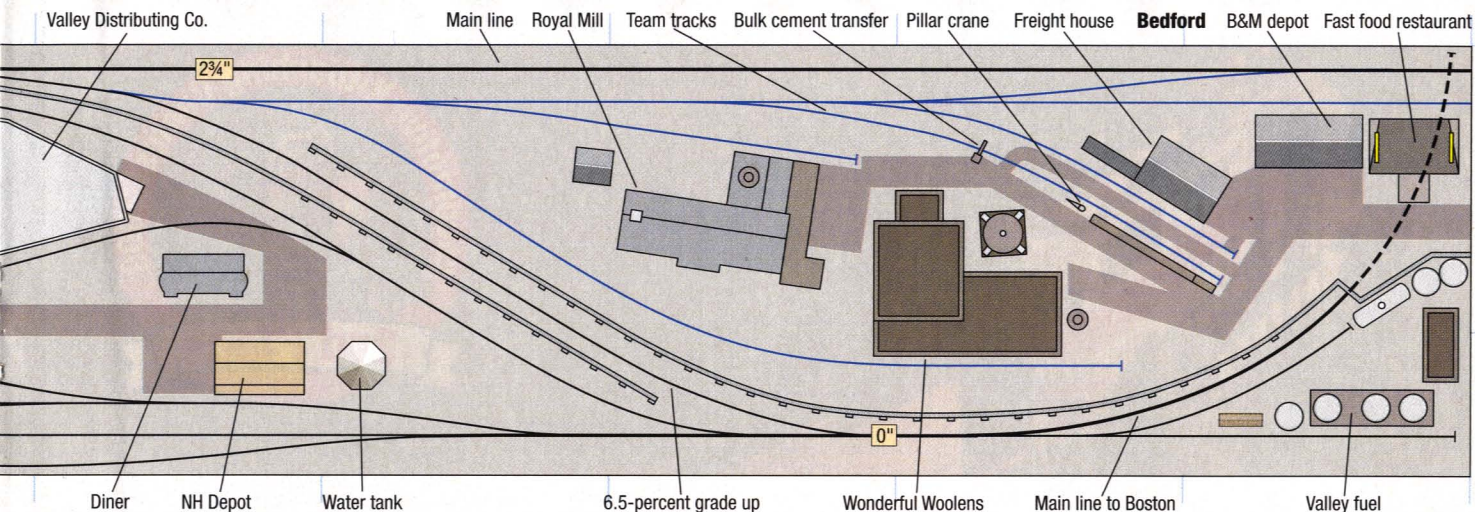


Illustration by Theo Cobb

test fit some of the actual track components and make any final adjustments. As I did these final revisions, I quickly realized I'd have to kitbash most of the buildings to fit the available spaces.

Then I set a few cars on the track plan to test the clearances and mentally envisioned each move. If things didn't work, I modified the track alignment or shifted turnouts until I had all of the bugs out of the track plan.

Next, I went over each track with a black pen and drew in the building footprints with a red marker.

Fitting urban structures

This layout offers many opportunities for structure kitbashing. I'm using the modular building systems made by Design Preservation Models (DPM) and Walthers. I've also used some of the larger Walthers Cornerstone building kits as raw materials to construct three-dimensional structures, flats, and low relief buildings. Since space is at a premium, I eliminated the loading docks from all the industries except for the largest. Instead, I spot the cars at freight doors in the walls of each building.

Enhancing apparent size

To enhance the apparent size of the railroad, most of the streets and structures angle away from the edges of the layout. Additionally, many of the buildings have asymmetrical shapes with corners that aren't square. I designed my plan to make the layout visually interesting and congested, yet open enough for an operator to easily reach its manual turnouts and uncouple cars with a uncoupling tool.

The car float carries 8 to 10 freight cars, although the layout has spots for

Bristol Ferry Terminal RR

N scale (1:160)
Scale of plan 1 1/2" = 1'-0", 12" grid
Layout size: 1'-6" x 8'-0"
Numbered arrows indicate photo locations

New Haven tracks ———
Boston & Maine tracks ———

more cars. This allows specific cars to be spotted and remain at each industry for more than one operating cycle. Since the upper level's rear track simulates a main line, I added a Faller drawbridge, set in the raised position, to indicate that the line continues on beyond the layout.

Operating potential

Except for the B&M yard and industries at Bedford, the New Haven owns and serves all the track on this layout. The car float slip in the town of Bristol Ferry is served by the New Haven. Since track space is at a premium, the switch crew must pull its inbound cars off the float, sort, and distribute them at the same time they're picking up the outbound cars from the industries in Bristol Ferry.

A storage track along the front of the layout holds outbound cars waiting for the car float. Next to the slip is a dual purpose track that receives tank car loads of fuel for the railroad tugboats and locomotives. The rest of this track stores locomotives and cabooses.

A New Haven yard switcher or road unit is stationed at Bristol Ferry. From here, the main line to Boston disappears into a tunnel that passes under the B&M in Bedford.

The New Haven's local RDC (Rail Diesel Car) is concealed in this tunnel until its scheduled arrival time at the Bristol Ferry depot. This arrival can tie up switching operations, as the

The track plan at a glance

Name: Bristol Ferry Terminal RR
Scale: N (1:160)
Size: 1'-6" x 8'-0"
Prototype: New York, New Haven & Hartford RR and Boston & Maine RR
Locale: New England
Era: Early 1950s
Style: Island
Mainline run: 8 feet
Minimum radius: 22"
Minimum turnout: no. 6
Maximum grade: 6 1/2 percent

switch job has to be in the clear for this first-class train's arrival. Then switching operations can continue until it's time for the RDC's return to Boston (back into the tunnel).

The railroad still maintains a water tank at Bristol Ferry, so an occasional steam locomotive can serve as the New Haven's switcher. The NH rotated locomotives from its small outlying yards back to the major engine terminals for monthly federal inspections. Thus, I have a good excuse to operate a different locomotive from my collection each "month," to represent this rotation of the motive power.

As the photo shows, the new railroad is under way, and its track is now fully operational. I'm already running trains and regularly operating the layout as I continue work on the railroad's structures and scenery. **MR**

Brad Smith is a hobby veteran who has been building models of his favorite New Haven equipment in many scales for more than 30 years. When he isn't working on this N scale project, he also has an extensive HO layout, and scratch-builds in 1 1/2" scale. Brad and his wife, Sherrie, live in suburban Milwaukee.



These HO scale McCloud Ry. SD38s were originally Kato SD40s. Lee Christopher describes how he kitbashed these lower-horsepower units to win 3rd place in our contest.

Kitbash two HO scale McCloud Ry. SD38s

Kato SD40s are the starting point for these 2,000 hp road units

By Lee Christopher • Photos by the author

Before Athearn came out with its Ready-to-Roll HO scale SD38s (upgraded Rail Power Products shells), I needed two more locomotives for my HO scale McCloud Ry. layout. Kato's SD40s seemed like an excellent starting point for my kitbashing project, as they have the same length and truck centers as the SD38s.

I kitbashed the two Kato models to represent SD38s nos. 36 and 38 as they appeared in the summer of 1997. Unit 36 is painted in the modern red-and-silver scheme, and no. 38 sports the old black, brown, and orange livery.

Besides the external modifications, I also added Digital Command Control (DCC), sound, and light-emitting diodes

(LEDs). These units needed to operate smoothly at slow speeds for switching and have the ability to pull at least nine or more freight cars up a curving 3 percent grade.

In short, the SD38s weren't intended to be museum pieces. Instead, I wanted dependable models that captured the look of their respective prototypes.

Locomotive Kitbashing Contest

We'd like to thank all of those who entered *Model Railroader's* Locomotive Kitbashing Contest. Andy Gautrey, who took second place, will describe how he kitbashed an HO scale Yakima Valley Traction interurban in the January 2010 issue. In March, contest winner Alan Mende will share his techniques for modeling a Jersey Central Lines class E2 0-8-0 in HO. – *Cody Grivno, associate editor*

Frame modifications

I disassembled each SD40 down to the bare frame before I started kitbashing. The first thing I noticed is that even after removing the light board, clear plastic light tube, and upper metal body weight, there wasn't enough room for a DCC sound decoder [see "Adding DCC and sound" on page 61. – *Ed.*]

To fix this, I first lowered the rear frame tower to make room for the speaker enclosure. See **fig. 1**. The amount of material that needs to be removed from the frame depends on the type of decoder and speaker you use.

While I was working on the frame, I shortened the portion that extends into the fuel tank. See **fig. 2**. The McCloud SD38s have 3,200-gallon tanks, which are shorter than the 4,000-gallon tanks used on the Kato SD40s. The tanks are mounted toward the rear truck, resulting in a noticeable gap between the front truck and the fuel tank.

I finished the modifications by milling channels in the frame to accept the LEDs, $\frac{3}{32}$ " brass tubes, and wires for the ditch lights, as shown in **fig. 3**. The tubes serve as housings for the LEDs and reduce light leaks through the plastic body shell. A motor tool, jeweler's saw, and files can also be used to cut the channels.

Detailing the roof

The external differences between the SD40 and SD38 include the number of radiator fans (three on the former, two on the latter), dynamic brake fans (smaller on the SD38), exhaust stacks (two small ones for the non-turbocharged 16-645E engines in the SD38), radiator grills (slightly smaller on the SD38), and the manual brake wheel at the back of the long hood. All of these features must be removed or modified to turn the Kato SD40 shell into an SD38.

First, I removed the radiator and dynamic brake fans. Where possible I fol-

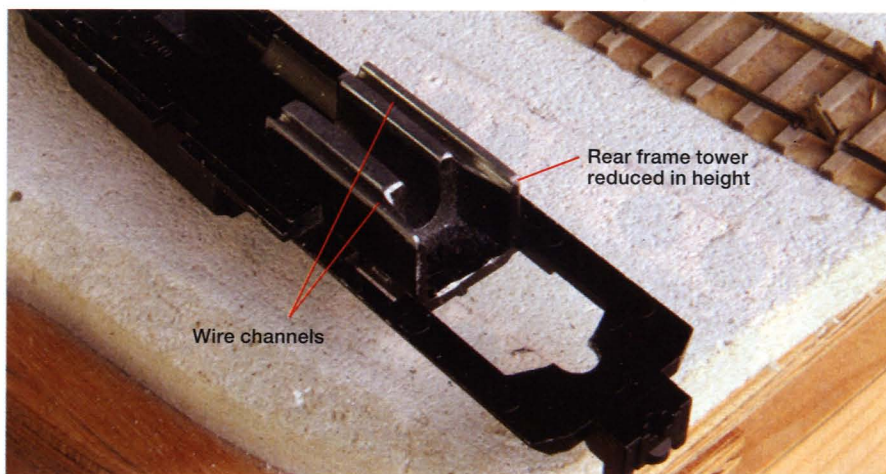


Fig. 1 Frame modifications. Lee reduced the height of the rear frame tower to accommodate a sound decoder and speaker. He also cut channels in the frame to run wires from the motor decoder to the rear truck and lights.

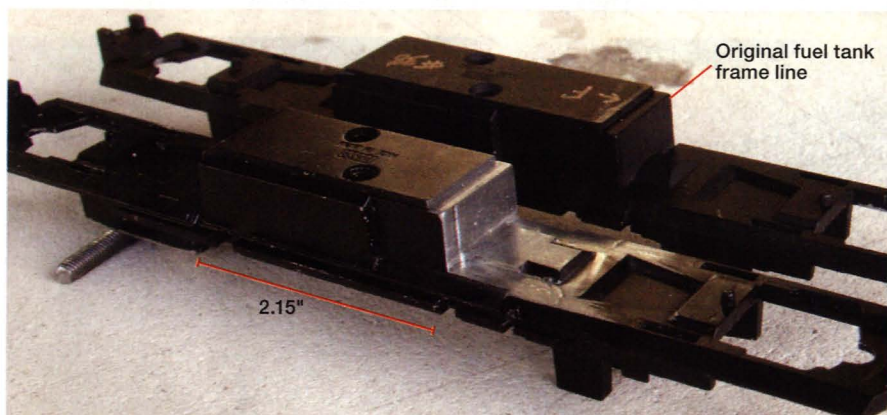


Fig. 2 More shortening. The Kato SD40 has a 4,000-gallon fuel tank, which is too big for the McCloud units. In order for the 3,200-gallon tank to fit (see **fig. 12**), Lee shortened the portion of the frame that extends into the fuel tank.

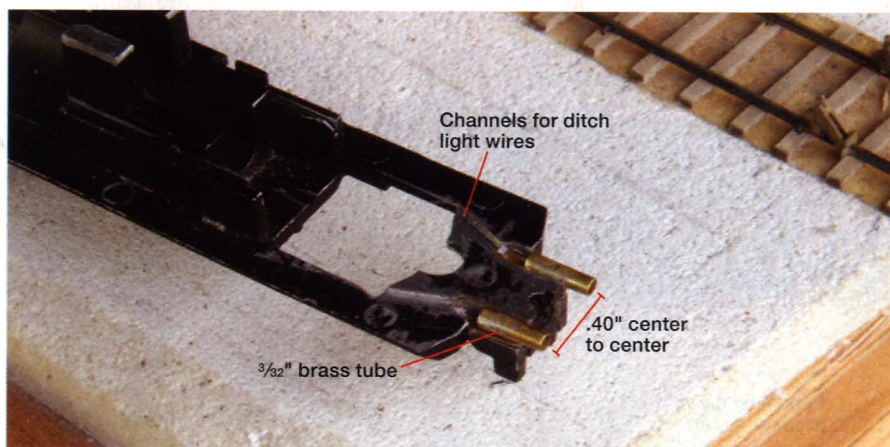


Fig. 3 Routing the ditch lights. To make room for the light-emitting diodes and their brass housings, Lee cut channels in the front and rear of the frame. He also cut channels for the wires so the shell would seat properly.

lowed existing roof panels outlines to minimize seams. I then assembled replacement roof panels by laminating two pieces of .030" styrene. See **fig. 4** on the next page. I made openings for the radiator and dynamic fans *before* cutting the panels from styrene sheet.

Next, I sanded the forward portion of the radiator grill flush with the body. Then I cut the opening for the new grill and installed wire grab irons, as shown in **fig. 5**. You can see the rooftops of nos. 36 and 38 with all of the details added in **fig. 6** on page 60.

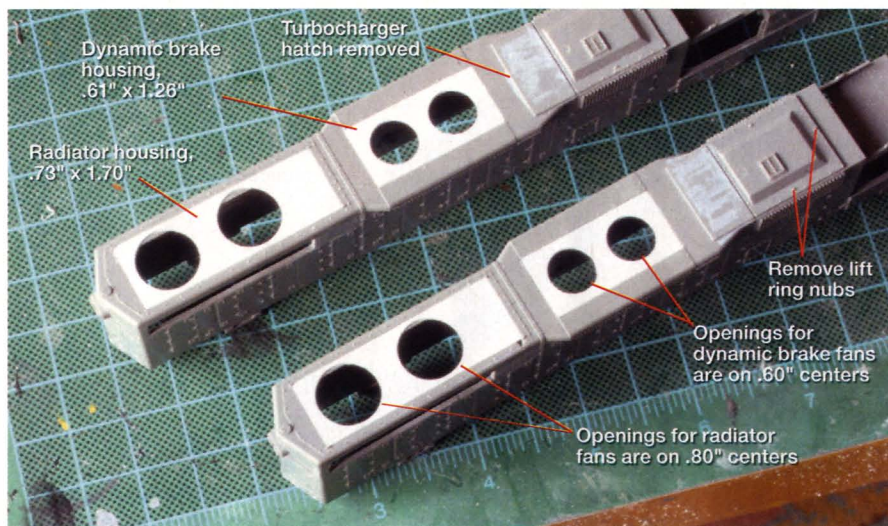


Fig. 4 Fan housings. Lee removed the molded fans on the SD40s and replaced the panels by laminating two pieces of .030" styrene sheet.

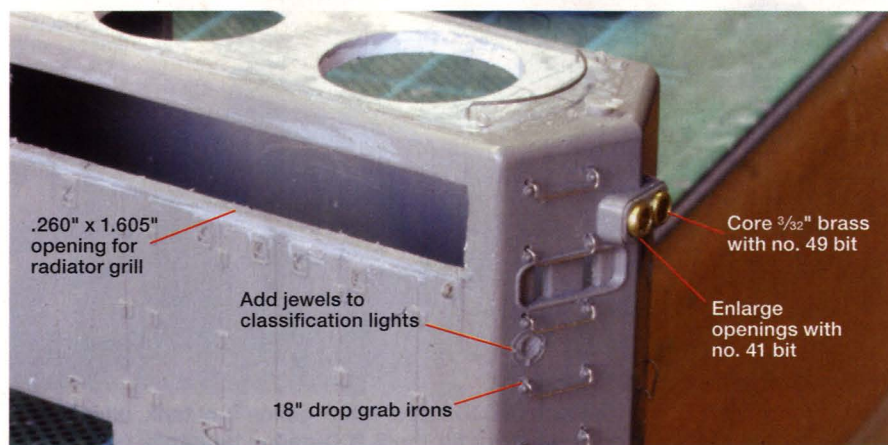


Fig. 5 Rear details. Lee replaced the plastic grab irons with wire ones, cut openings for the radiator grills, and added brass tubing for the rear lights.

Cab, walkway, and pilots

Most of the cab modifications, shown in **fig. 7** on the opposite page, were done so I could install LED headlights and a rotary beacon. The Kato shell has an extension that serves as the interior roof of the cab. I made sure the light tubes, LEDs, and resistors were positioned so the cab would seat properly.

Next, I turned my attention to the pilots. I started by replacing the molded plastic steps with A-Line brass etchings. See **fig. 8**. When attaching the steps, I applied the cyanoacrylate adhesive (CA) sparingly. If the holes get plugged with CA, it will ruin the see-through quality of the steps.

Then I added uncoupling levers on the front and rear pilots and drilled holes for the ditch lights and snow plow, as shown in **fig. 9**. In **fig. 10** you can see the modifications I made to the plow. If it's not close to the pilot, the coupler trip pin on the adjacent car or locomotive may catch on the bottom edge of the plow. To further reduce this risk, I installed long-shank couplers on the front of each locomotive.

You can see the details that I added to the long and short hood and truck sideframes in **fig. 11** on page 62.

Fuel tank modifications

Figure 12 shows the modifications I made to the Kato fuel tank. I started by cutting the tank in half. Then I cut a portion from each tank half until they measured 2.3" long. I reassembled the tank and reinforced the joints with styrene strip.

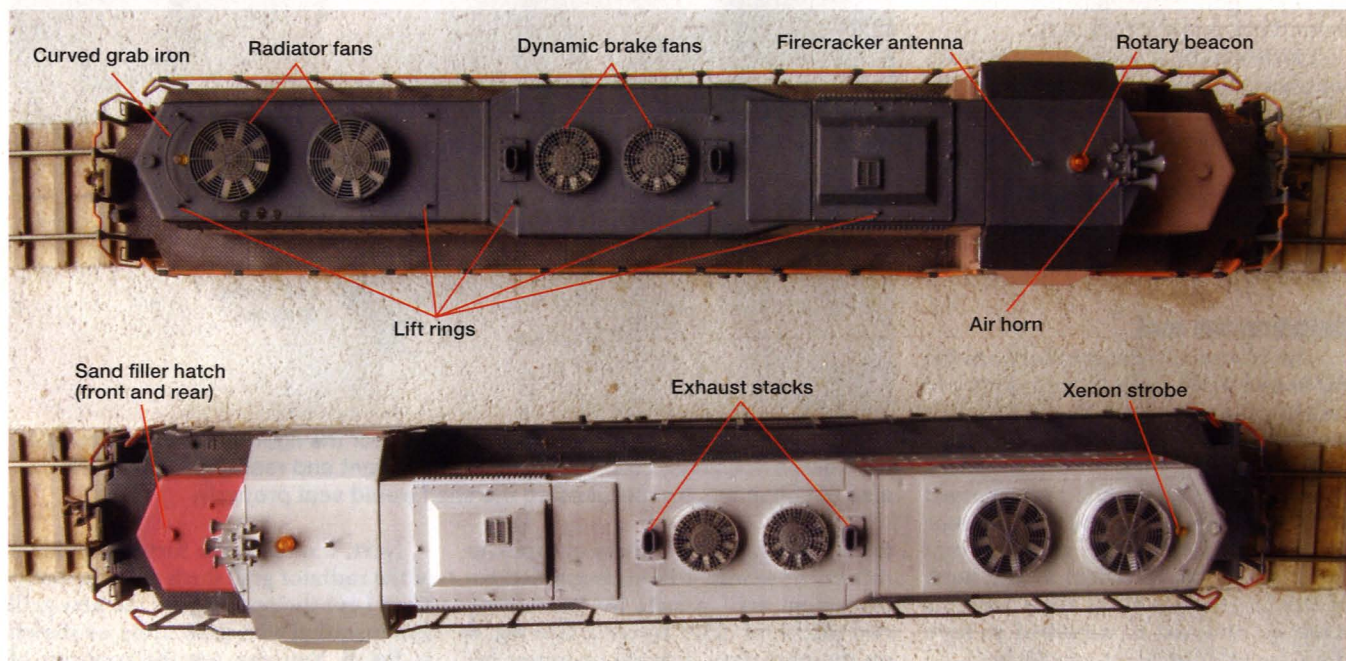


Fig. 6 Completed roof. This overhead view shows the details Lee added to the two locomotives. Though the units are painted in different schemes, the rooftop details are virtually identical.

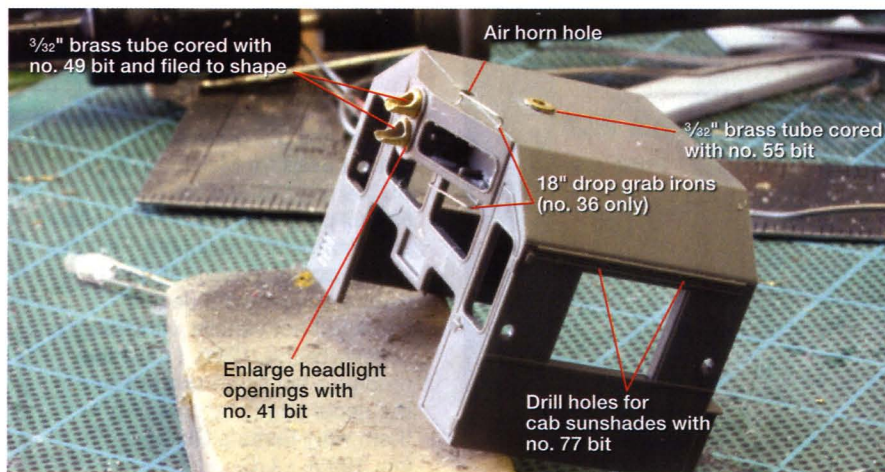


Fig. 7 Cab modifications. Compared to the long hood, the cab was easy to modify. Lee made the modifications listed above to accommodate the LED headlights, illuminated rotary beacon, air horn, and cab sunshades.

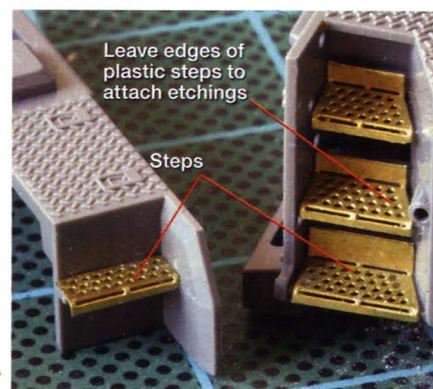


Fig. 8 See-through steps. To make the step wells more prototypical, Lee removed the molded steps and replaced them with brass etchings from A-Line. He attached the brass steps to the plastic shell with CA.

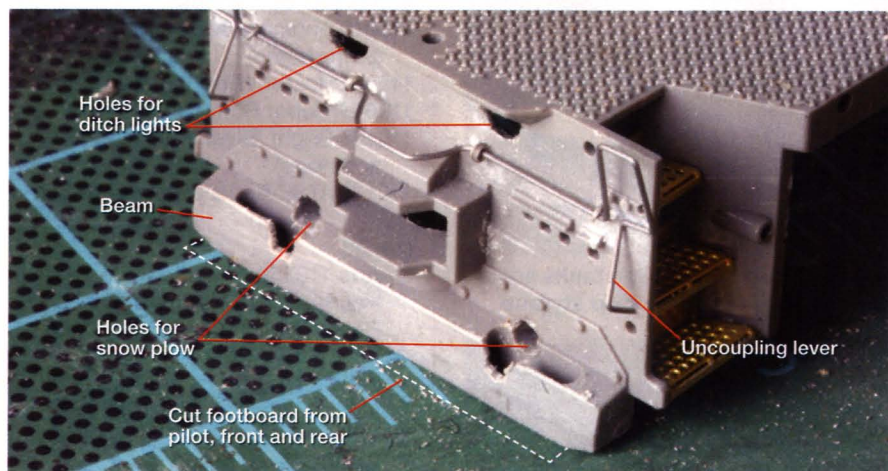


Fig. 9 Pilot details. Lee added an uncoupling lever and drilled holes for the snow plow and ditch lights. The lever and lights are on both pilots; the plow is only on the front. He filed the beam so the plow would seat closer to the pilot.

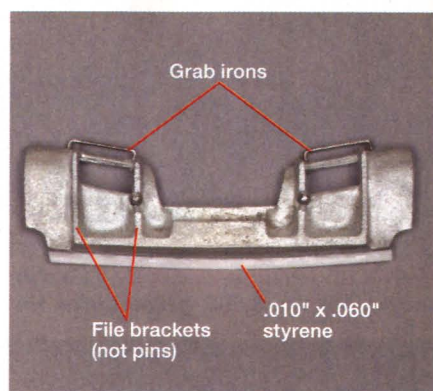
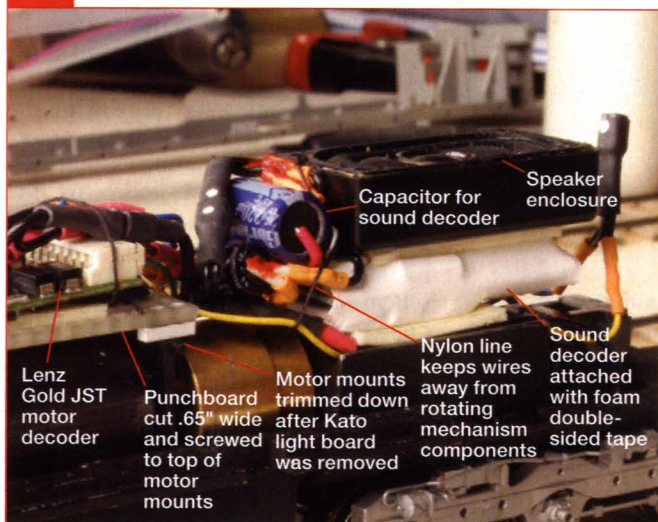


Fig. 10 Snow plow modifications. Lee filed the support brackets so the plow would fit tight against the pilot. He also added a strip of .010" x .060" styrene to the plow with CA so it would look more like the prototype.

Adding DCC and sound



Though it was a tight fit, Lee installed separate motor and sound decoders on his McCloud Ry. SD38s.

I installed separate motor and sound decoders in the SD38s. I used a Lenz Gold JST motor decoder with a Power-1 module, which has performed remarkably well on dirty track. I chose the SoundTraxx DSX decoder (boosted with extra capacitors) for the sound unit. Note: The SoundTraxx Tsunami TSU-1000 (no. 827109) wired decoder is now available for the non-turbocharged EMD 645 prime mover with a variety of horns and would substitute for both the DSX and Lenz decoders. A replacement-board version of this SoundTraxx decoder, TSU-AT1000, is also available. It's part no. 828848.

I used standard T1 (3mm-diameter) warm-white LEDs for the SD38s. Previous *Model Railroader* articles have shown that as long as you don't cut into the diode, the outside diameter of the lens can be reduced by placing the LED in a drill chuck or small lathe and touching the sides with a file.

The installation of sound and lighting effects can enhance the realism of a locomotive. You can see the finished decoder installation at left. — L.C.



Fig. 11 More details. Lee also detailed the short and long hoods and truck sideframes. He used 1/16" Lucite rod for the light pipes.

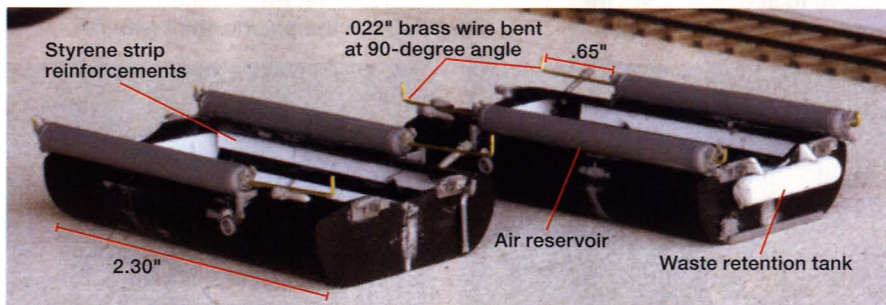


Fig. 12 Shortening the tanks. Lee shortened the Kato 4,000-gallon tanks so they'd look like 3,200-gallon tanks. He reinforced the joints with strip styrene.

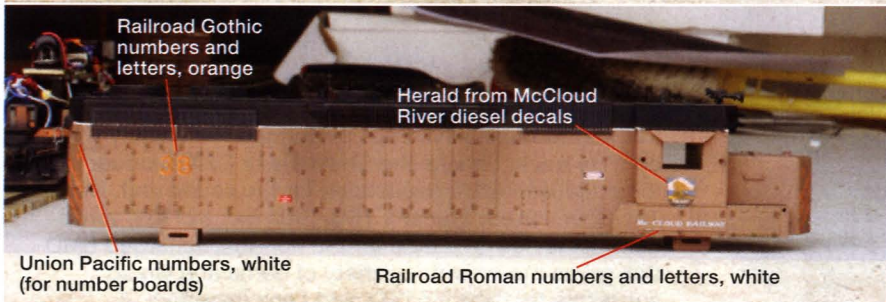
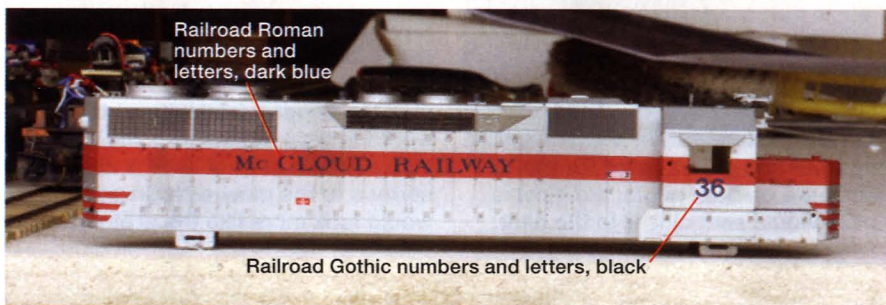


Fig. 13 Patchwork decals. These two images show the shells with decals applied. Lee had to use a variety of decal sets to letter these engines.

I added fillers, plugs, and vents from the Cannon & Co. fuel tank detail set. Then I assembled and installed the air reservoirs, making sure the walkways would seat properly above them. I drilled holes in the end of each reservoir so I could install .022" brass wire air lines.

In the mid-1990s, the McCloud Ry. added waste-retention tanks to its SD38s

to capture residual engine oil. I made the one shown in **fig. 12** from .125" styrene tube, .030" styrene sheet, and left-over fittings from the Cannon & Co. fuel tank detail set.

I test fit the retention tank to make sure it wouldn't interfere with the swing of the rear truck before cementing it to the fuel tank.

McCloud Ry. paint

Below are the paints and mixing ratios I used for McCloud Ry. SD38s nos. 36 and 38. I used Floquil paints for the body shells and Parma International's Faskolor for the acetal plastic railings. Before applying the decals I sprayed both shells with Testor's Glosscote (no. 1261). I gave the models a flat finish and masked the decal edges by spraying them with Testor's Dullcote (no. 1260). – L.C.

No. 36

40001 Fasblack (railings)
40003 Fasred (railings)
110010 Engine Black (underframe)
110011 Reefer White (sill stripes)
110087 Depot Buff (cab interior)
110101 Bright Silver (nose, cab, and hood)
110176 ATSF Red (stripes)

No. 38

3 parts 110250 Canadian National Orange, 1 part 110011 Reefer White (orange chevrons)
4 parts 110175 Southern Ry. Freight Car Brown, 2 parts 110070 Roof Brown, and 1 part 110011 Reefer White (nose, cab, and hood)
40007 Fasorange (railings)
110010 Engine Black (roof and underframe)
110011 Reefer White (pinstripe)
110087 Depot Buff (cab interior)

Painting and weathering

I left both models disassembled for painting, decaling, and weathering. I started by painting the units using the colors listed in "McCloud Ry. paint" above. I applied the paints with an air-brush, thinning them following the manufacturer's instructions.

Commercial decals aren't available for McCloud units in these two paint schemes, so I had to paint all the stripes. I applied the colors in order from lightest to darkest.

I found out the hard way that neither organic solvent-based nor acrylic paints would stick to the acetal plastic Kato uses for the handrails on its models. However, experienced members of the Los Angeles Model Railroad Society told me about the Faskolor line of paints from Parma International. These are water-based paints designed for flexi-

ble remote-control car bodies and hold up well on locomotive handrails.

Once the two units were painted, I sprayed them with Testor's Glosscote to provide a glossy finish for the decals. I cobbled together lettering from various Microscale sets, as noted in **fig. 13**.

Then I sprayed the models with Testor's Dullcote to seal the decals. The flat finish also served as the first step in weathering, which I applied to different degrees. Number 36 was repainted a few months before the period I'm modeling, so I weathered it lightly.

In contrast, no. 38 had been in the brown, black, and orange for 15 years by the summer of 1997. The paint was starting to fade, and ballast dust and soot had accumulated on the trucks and roof respectively. In addition, the McCloud River Railroad lettering had been cut from the herald on the cab. New McCloud Railway lettering was put on the battery box doors.

I weathered the models by putting a few brown streaks below the battery box doors; applying heavily thinned Polly Scale Weathered Black around access covers, doors, and hinges; and spraying thinned rust and dirt on the truck sideframes. I suggested that the wheel bearings had been changed by painting select journals a contrasting color based on photos of the prototype engines. I sprayed each model with thinned Weathered Black and Brown to further blend and dull the colors.

Finishing touches

To match prototype images, I placed a broom and shovel behind the nose grab irons. These small details add to the realism of the McCloud Ry. units.

Though SD38s are now available as Ready-to-Roll models from Athearn, including two different McCloud RR paint schemes, I have the satisfaction of knowing these locomotives are uniquely mine. The finished models look right at home leading freight trains up the curving, tree-lined, three-percent grades. **MR**

Meet Lee Christopher

Lee Christopher lives in Southern California with his wife, Diane, and daughter, Sarah. He'd like to thank Jeff Forbis and the McCloud Ry. staff and train crews for their generosity during his visits to the railroad.



Materials list

A-Line

29210 sunshades
29238 diesel steps

American Hobby Distributors

8 ohm, 1 watt oval speaker,
.63" x 1.38"
Speak EZ oval speaker enclosure,
.63" x 1.38"

BLMA Models

4511 18" drop grab irons

Builders In Scale

251 brass chain

Cal-Scale

393 m.u. stand
522 uncoupling lever
523 curved roof grab irons

Cannon & Co.

1405 radiator grills and shutters
1704 radiator fans
1706 dynamic brake fans
2155 air reservoirs
2156 fuel tank detail set

Detail Associates

1805 firecracker antenna
2402 exhaust stack
2507 .022" brass wire
2508 .028" brass wire
2807 speed recorder
2903 Xenon strobe flasher
3001 sand filler cover
6426 19½" straight grab irons

Details West

106 Strato-Light rotary beacon
155 snow plow
177 brake wheel
327 Leslie S5T-RR air horn

Evergreen Hill Design

603 street broom
604 shovels

Evergreen styrene

103 .010" x .060" strip
214 .125" tube
220 .035" rod
9040 .060" sheet

Kadee couplers

58 scale coupler (rear pilot)
157 long center shank (front pilot)

Kato

37-6320 undecorated Electro-Motive Division SD40 (2)
750021 Flexicoil truck sideframes (no. 36 only)

750023 Flexicoil truck sideframes (no. 38 only)

K&S Engineering

1144 3/32" diameter brass tube

LEDtronics

LD120-01W-30D warm white
3mm light-emitting diode
(six per locomotive)

Lenz Digital Command

Control decoders
GOLDSP gold JST-series
superpack

Microscale decals

MC-4018 McCloud River SD38 diesel locomotives (no. 38)
90001 railroad Roman numbers and letters, white (no. 38)
90007 railroad Roman numbers and letters, dark blue (no. 36)
90102 railroad Gothic numbers and letters, black (no. 36)
90120 railroad Gothic numbers and letters, orange (no. 38)
90161 Union Pacific numbers and letters, white (nos. 36 and 38)

Miniatronics Corp.

18-Y03-10 1.5V yellow micro miniature lamp
(one per locomotive)
50-003-01 three-pin micro-mini connector (one per locomotive)
50-001-02 two-pin micro-mini connector (three per locomotive)

M.V. Products lenses

300 .052" clear

Plano Model Products

14651 lift rings

Selley Finishing Touches

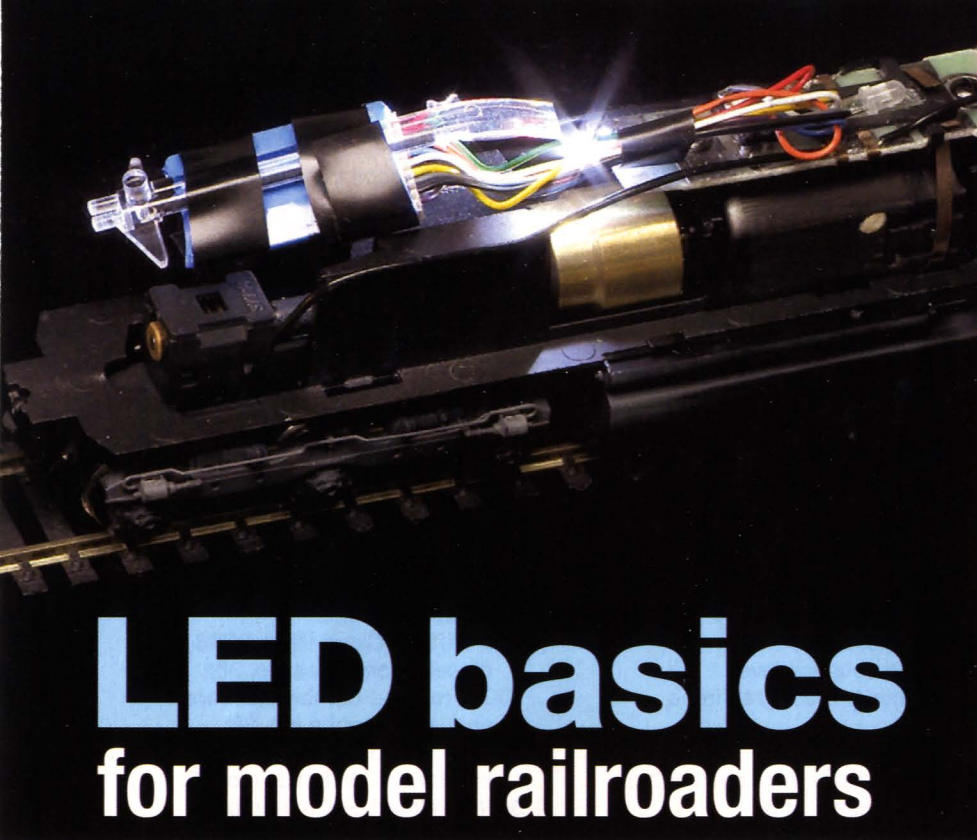
647 crew figures

SoundTraxx

827109 TSU-1000 Electro-Motive Division locomotives with 645 prime mover (non-turbocharged)

Vector Electronics & Technology

59P44-032 punchboard, 4½" x 6" with .042" diameter holes



Super-bright light-emitting diodes provide trouble-free lighting for many modeling applications, including locomotive headlights. Jim Forbes photo

LED basics for model railroaders

How to select and use light-emitting diodes for your next lighting project

By Wayne McNab • Illustrations by Theo Cobb

Imagine never having to take a structure or streetlight off your layout to change a lightbulb and you'll know the main reason why every model railroader should get to know light-emitting diodes (LEDs). These solid-state devices draw little current, dissipate no heat, and have a life expectancy of up to 100,000 hours. Though early LEDs had low light output and came in red only, modern super-bright LEDs are available in a spectrum of colors.

You can use LEDs on both DC and Digital Command Control (DCC) layouts. (For an example of an LED project, see my article "Easy interior lighting with DCC power" in the May 2008 *Model Railroader*).

A wide variety of inexpensive super-bright LEDs, resistors, and other components are available from online electronics distributors, including Digi-Key Corp. (www.digikey.com) and Mouser Electronics (www.mouser.com).

How LEDs work

A diode is a semiconductor that has two electrodes (an anode and a cathode) and allows current to flow in only

one direction. Typical diodes release energy as heat. An LED releases energy as light.

For current to flow, the diode should be connected so that positive voltage is applied to the anode and negative voltage to the cathode, as shown in **fig. 1**. This is referred to as forward-biased current flow.

An LED must be forward-biased or it won't illuminate. As you can see in **fig. 2**, a round LED has a flat side cast into it denoting the cathode. The round side is the anode.

Choosing an LED

There are a few basic specifications to consider when choosing an LED. First, the LED must physically fit your project. You'll also want to choose a color, such as amber, red, or white.

Most LEDs are available either clear or translucent. Clear LEDs are brighter and more directional than a similarly sized translucent LED, which gives off a diffused light.

Light-emitting diodes also come in different viewing angles. Between 20 and 40 degrees are the most common,

although you can find LEDs that have 140-degree viewing angles. The narrower the viewing angle, the more light is focused in one direction, which is useful for modeling applications like a locomotive headlight. A wider viewing angle generates less light, but would work for lighting a structure interior.

The brightness of an LED is measured in millicandela (mcd) at 20 milliamps (mA). Light output varies between 5mcd for a standard LED to 4,000mcd for a super-bright LED. I mainly use super-bright LEDs, since they're not only a lot brighter, but also draw less current than standard LEDs.

Keep in mind that the 20mA specification above is only a brightness standard used by manufacturers for comparison. The actual light output of an LED depends on the amount of current that runs through it. If you apply too much current to the LED it will burn out, so you'll need to know the LED's maximum forward-biased current (If). Most LEDs operate up to 25mA.

You'll also want to note the forward-biased voltage drop across the LED (Vf). This ranges between 2V and 5V. The voltage to the LED must be equal to or higher than this specification, or the LED won't illuminate.

Resistors and LEDs

Next, you'll need to choose a resistor to use in conjunction with the LED. A resistor limits the amount of current flow in a circuit so the LED isn't damaged. The amount of resistance is measured in ohms (Ω).

To find the resistance value required for a circuit, you'll need to use Ohm's Law. This formula is $R = V/I$, where R equals resistance in ohms, V equals voltage across the resistor in volts, and I equals current flowing through the resistor in amps.

You can see an example of a simple circuit in **fig. 3**. Let's say you have a 12V battery, and you want 2 amps to flow in the circuit. Then the resistance you need would be: $R = 12V/2A$ or 6Ω .

Another characteristic of a resistor is that it generates heat, measured in watts. To find this value, use the formula $W = V \times I$, where W equals power in watts, V equals voltage across the resistor, and I equals current flow through the resistor. For example in **fig. 3**, the value would be $W = 12 \times 2$ or 24W. For most model railroad applications, $\frac{1}{4}W$ or $\frac{1}{2}W$ resistors will suffice.

The LED that I use for many of my projects is made by Lumex and can be purchased from Digi-Key (part no. 67-1693-ND). This LED has the following specifications: brightness = 8,000mcd, $V_f = 3.5V$, and $I_f = 25mA$.

The circuit in **fig. 4** uses this LED and a 12V power source. First I'll calculate the voltage across the resistor (V_r), which is Total voltage (V) - the resistor's V_f value or $12V - 3.5V$ or $8.5V$.

Next I'll calculate resistance, where $R = V_r/I_f$ or $8.5V/.025A = 340\Omega$. The formula to find the power of this resistor is $W = V_r \times I_f$, or $8.5V \times .025A = .212W$. Since this is close to the limit of a $\frac{1}{4}W$ resistor it would produce a lot of heat, so I'll use a $\frac{1}{2}$ watt resistor instead.

Also, I wouldn't operate any LED at its maximum limit, which in this case is 25mA. The LED wouldn't last very long. Instead I'll use a resistor with a higher resistance value to reduce the LED's brightness to suit the application. For example, to make the LED above half as bright, I'll halve the current in the equation $R = V_r/I_f$. The resistance value is $R = 8.5V/.013A$ or 654Ω . The power of this resistor is $W = 8.5 \times .013$, or $.11W$.

Applications for DC layouts

Using LEDs on a DC layout is a bit simpler than using one connected to track power on a DCC layout.

For example, let's say you want to replace the light bulb in a locomotive headlight with an LED, and you have a DC layout. First, find an LED that is the color you want and physically fits in the headlight housing.

Next, choose a resistor to use with the LED. Increase the throttle on your DC power pack to the maximum, and measure the voltage across the rails. Let's say this equals 14V. Then calculate the voltage across the resistor: $V_r = \text{Total voltage} - V_f$, or $14V - 3.5V = 10.5V$.

Then calculate the minimum values of the resistor where $R = V_r/I_f$, or $10.5V/.025A = 420\Omega$. To find the power value use $W = V_r \times I_f$ or $10.5 \times .025 = .26W$. I'd use a $\frac{1}{2}W$ resistor. You can then increase the resistance value to decrease the LED brightness.

For applications such as structure interiors, measure the maximum voltage of your accessory power pack and use that value in the formulas above.

You can also wire LEDs in series, as shown in **fig. 5**. The advantage of this circuit is that it doubles the light output with the same current.

To calculate the minimum resistance values of this circuit, subtract the voltage drop for each LED. The voltage across the resistor would be $V_r = V - V_f - V_f$ or $14V - 3.5V - 3.5V = 7V$.

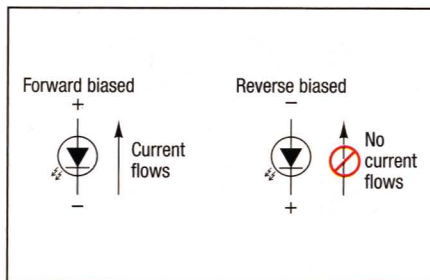


Fig. 1 Current direction. An LED will light only if the current is in the forward-biased direction.

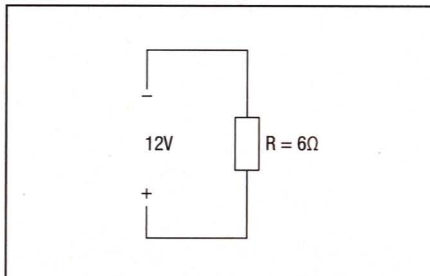


Fig. 3 Ohm's Law. To limit the current draw in the circuit above to 2A requires a 6Ω resistor. The formula for finding this value is $R = V/I$.

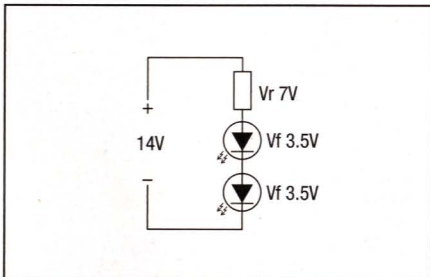


Fig. 5 LEDs in series. This circuit is useful because it doubles the light output compared to a single LED, but draws the same current.

The minimum resistance is $7V/.025A$, or 280Ω , and minimum power is $7V \times .025A$, or $.175W$.

A variation for DCC

A DCC system uses alternating current (AC) at the rails, so the polarity is constantly reversing. If you connect an LED directly to track power, it will only turn on when the current flows in the forward-biased direction, which is about half the time.

For track-powered LED circuits on my DCC layout I use a bridge rectifier, which converts the AC from the track into DC. An example is shown in **fig. 6**. I use a Diodes Inc. DF005 bridge rectifier that outputs 13.6V.

The minimum resistance required for the circuit is 404Ω . This value is okay for a standard LED, but would be much too bright using a super-bright LED. I've found that a $4,700\Omega$ resistor

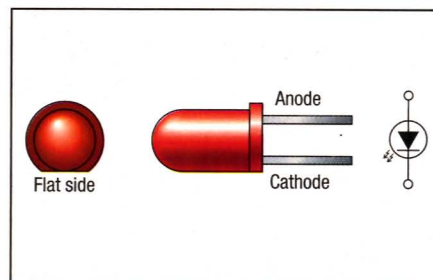


Fig. 2 Round LED. The electrode on the flat side of the LED is the cathode, which connects to negative voltage.

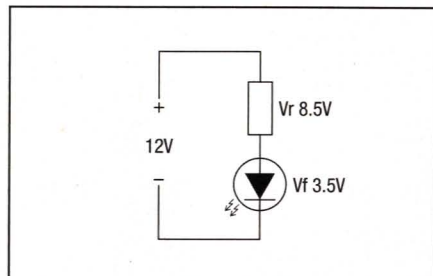


Fig. 4 LED circuit. In this circuit V_r is the voltage across the resistor and V_f is the forward-biased voltage drop across the LED.

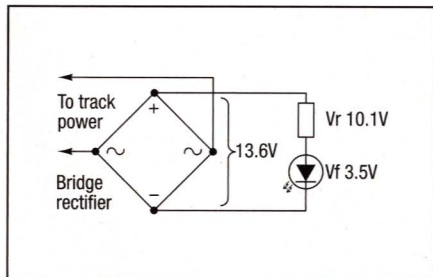


Fig. 6 LED circuit for DCC. A bridge rectifier converts AC to DC voltage, which is useful when connecting an LED to track power on a DCC layout.

still provides adequate brightness when using a super-bright LED.

Also consider total current draw. If you have 20 LEDs connected to track power, each drawing 25mA, then the total current draw would be 500mA. Using $4,700\Omega$ resistors each super-bright LED draws 2.2mA, so 20 LEDs would draw only 44mA.

When connecting an LED to a function output of a DCC decoder, you don't need to add a bridge rectifier. The decoder already includes a rectifier and delivers DC power.

Whether you use DC or DCC, LEDs let you add maintenance-free lighting to your model railroad. **MR**

Wayne McNab lives with his wife in Pender Island, B.C., Canada. His last article for Model Railroader, "Easy layout control panels," appeared in the July 2009 issue.

Pounding out lava-rock dirt



Crushed lava rock, sold as a ground cover for gardens, makes perfect soil for Hal Miller's O scale layout, which is set in rural Oklahoma.

A garden decoration proves to be the way to model Oklahoma earth

By Hal Miller • Photos by the author

The best discoveries are often the ones you make by accident. One such event led me to make scenic dirt for my model railroad layout out of lava rock.

Lava rock is just what the name implies: a porous volcanic material. You can find it in various sizes and colors at your local home-improvement store or

garden center. Its primary uses are as a ground covering in flower beds and as a grease-catcher in gas grills.

Being a strictly charcoal guy, I had encountered lava rocks only in flower-beds. They tend to spill over onto the sidewalk, especially when my kids step in them. I noticed one day that if you happen to step on a lava rock and drag



Fig. 1. Hal uses a metal pipe to crush the lava rock in an old margarine tub set on his concrete driveway.



Fig. 2. After crushing the rock into dirt, Hal sifts it to remove larger fragments. The bigger bits can be used as talus.

it with your foot, it leaves a streak on the sidewalk, like colored chalk.

That got me to thinking about what I could do with it on my O scale layout, which is set in rural Oklahoma. If you've ever been there, you'll notice the dirt is a reddish, iron-oxide color – exactly the same color as the streaks on my sidewalk. I'd been concerned about replicating that soil on my layout, expecting to have to lug a 5-gallon bucket of it home to Wisconsin the next time I visit relatives in Oklahoma.

That led me to wonder what I'd get if I crushed the lava rock. I threw a handful of rocks into an old margarine tub and pounded it with the blunt end of a scrap of lumber. Eventually, I got some dust that was the perfect color and consistency for Oklahoma dirt, plus some small rocks I could use here and there around the layout.

I figured there had to be a better way to crush the rock. I considered using our blender to speed the work, but the thought of my wife's reaction deterred me. Instead, I found a two-foot scrap of 2-inch steel pipe, which happened to have a flat pipe cap on the end. It turned out to be the perfect pestle for my margarine-tub mortar.

I dumped some newly bought lava rocks into the bucket (don't use the



Fig. 3. Hal brushes undiluted white glue onto his layout's red-painted terrain before sifting on the dirt. He applies grass and bushes right after the dirt.

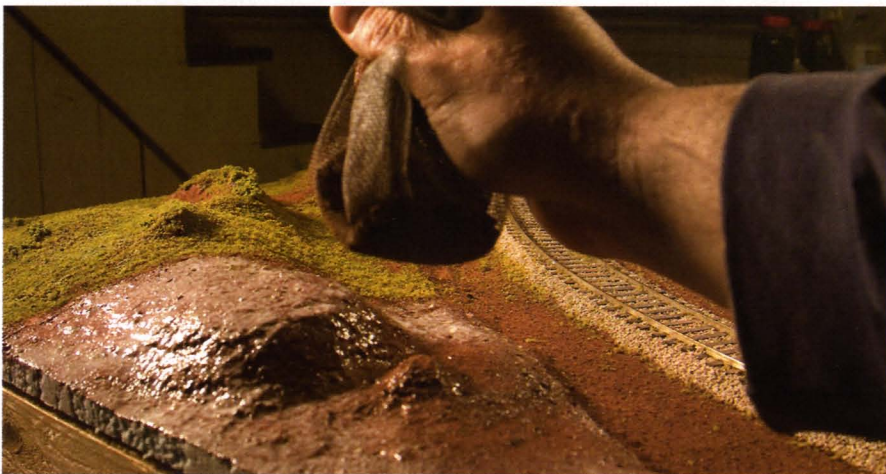


Fig. 4. Hal uses window screen to dust the dirt onto his O scale layout. For a smaller scale, he recommends using a finer mesh material.

ones in your flowerbeds or grill), put on appropriate eye protection, and started pounding, as in **fig. 1**. I found my pipe pestle crushed the rock in about a third of the time of the wood, plus there were no splinters in my dirt!

After crushing the rock, I sifted it through various screen meshes, as seen in **fig. 2**. For O scale, window screen seems to work well; for smaller scales, I'd recommend something finer, like plumbing screen or even pantyhose.

I apply the dirt to my layout in two ways. One is to sprinkle it onto the wet red latex paint I use as a scenery base. The other is to paint the ground, let it dry, then paint on full-strength glue and sprinkle the dirt over the terrain, as in **fig. 3** and **fig. 4**. The best results seem to come from the latter method.

I can also add grass and bushes immediately after applying the glue and dirt, speeding the scenicking process. The final result, to my eye, looks more realistic than merely putting grass and ground foam over paint, for not much more effort.

The thought occurred to me that since it is rust-colored, lava rock might be magnetic and capable of fouling locomotive motors. To test it, I put a strong magnet over the pile of crushed rock to see if anything would cling to the magnet. A few fragments did, but only after I touched it to the pile.

I wouldn't recommend using this as ballast, where locomotives would pass directly over it. But next to the track – especially held down by full-strength white glue – the crushed rock poses no threat to locomotive motors.

Lava rock comes in a variety of colors besides red, including gray, brown, and black. With the right type of lava rock, or a mix of several types, you can replicate the soil native to the area your layout represents. **MR**

Hal Miller models railroads of the central United States, primarily the Rock Island, St. Louis-San Francisco and Missouri-Kansas-Texas. He is also the editor of Kalmbach Publishing Co.'s hobby trade magazine, Model Railroader.

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The long road to Tuxedo Junction



57 years of modeling ups and downs led to this Santa Fe-inspired HO layout

By Roger Mehl • Photos by the author

The path leading to the layout you see here began in 1952, when I was about 8 years old. My mother and I were at the local A&P picking up some groceries when I noticed a box of Kix cereal bearing a special promotion. For 50 cents and two box tops, I could get a model train car. I grabbed my mother's dress and pointed out the offer.

"You'll have to eat the Kix, and also use your 50 cents (a month's allowance) to pay for it," she said. "But we buy cereal anyway, so if you want to do this, it's okay." Never has a mother been better to a kid in the history of the world.

Months later, I ended up with five cars and an unpowered F3 diesel. This was all HO scale Varney equipment, and the F3 and the caboose were pretty crude. But I was hooked for life.

Live and learn

It was a couple of years later before I had a layout. It was laid out on half an old ping-pong table with brass flextrack

(the kind with fiber ties), and a couple of buildings. It was just an oval with 12" radius curves, but my new Penn Line Whitcomb four-wheel industrial switcher had no problem pulling those Varney cars around.

A few years later, the layout had been expanded, and those tight curves were widened a little. The track ran behind the laundry sink, and I learned the hard way that fiber ties shrink when soaked with water and allowed to dry out. I had a lot of derailments behind those tubs.

In 1959, I was pumping gas and had some income. I bought my first brass locomotive, a Sierra Ry. 2-6-6-2 from All Nation Hobby Shop. The spur gears made awful noises when running, but the engine was reliable.

Not so reliable was the engineer. In 1961, a week out of high school, I bought a Tenshodo Santa Fe 3460-class 4-6-4. On its maiden trip over my layout, the big Hudson picked a rail joint and landed nose-first on the cement floor. Everything forward of the boiler

1. A pair of 2-10-2s tugging a solid reefer train puffs upgrade through the desert on Roger Mehl's HO scale Tuxedo Junction. Roger, who has been modeling for 57 years, says this is his last layout.

front was destroyed. I took a deep breath and decided that it was time for me to learn to solder. It took a few weeks, but the Hudson was repaired.

That wasn't the only dumb thing I did. I bought a United 4-8-4 in 1965, and wanted a paint job that would resist chipping. I decided to try giving it a baked finish. I painted the locomotive and put it in a hot oven. After an hour every solder joint was melted. I held my breath and didn't touch it for another hour. The locomotive survived.

My last layout

Years passed, and I kept modeling through several moves, filling boxes of models as I went. Then, 13 years ago, I retired from my job with the corporate side of Conrail, and my wife Betsy and I moved to the Caribbean.

I had intentions of modeling there, but discovered that the relentless humidity and salt air eat all metals and electronics. We even kept our television remote control in a plastic zipper bag.

The climate proved impossible for a layout, so I didn't build one; during our five years there, I stored all my train equipment, protected from the air. I built some pretty neat models, though.

When we tired of living in paradise, we moved to Rochester, Minn. Our new house had a large room in the lower level just begging for a layout. I unpacked all of those boxes and started building what I consider my last layout. Since my next move will probably be to some form of assisted living facility, I won't be building another one. But I don't mind that at all.

This layout is simply an expression of what is important to me. I really like running trains, so I wanted a long mainline run. I enjoy yard switching and prototypical operation, but I had to be able to handle the layout by myself. I wanted to model the Santa Fe in 1952 somewhere in the Southwest, but not depict an actual location.

Most important is the need for lots of locomotives. I decided to model a division point because, as I remembered from my childhood, the division point was where all the action was. When I would go on vacations as a kid, I had an uncanny knack for finding a division point roundhouse and giving myself a complete tour.

I can still remember the smells of a working roundhouse. It was during those years that I became a nut for steam locomotives, and over the years I have acquired 26 of them. To run them all, I need to change power on every train that I run, and run a lot of double-headers. This gives me an excuse for a big roundhouse.

The focal point of the layout is a division point, Tuxedo Junction. In the 1950s I discovered *Model Railroader* and became a faithful reader. I remember an article by George Allen about building a layout he named the Tuxedo Junction, after the Glenn Miller tune [October 1952 –Ed.]. This article not only motivated me in model railroading, but introduced me to jazz as well. The Tuxedo Junction has been the name of my railroad ever since, and I play the tune when visitors see it for the first time.

Kitbashing and scratchbuilding

Over the years I learned to take advantage of any kit that could work, but when no suitable kit was available, I jumped right into scratchbuilding. My Santa Fe roundhouse is scratchbuilt from styrene, and I patterned it after the one in San Bernardino. It took a bit of a beating from the moves; when I unpacked it, about a third of it was



2. A freight rumbles through Los Campos with 2-8-2 no. 3100 in the lead. Roger's Route 66 tourist town is complete with roadside motel and tourist traps.



3. A 2-8-4 rolls across a trestle over a dry wash in the Sonora Desert. Engine no. 4102 is a Pacific Fast Mail brass import that dates to 1960.

smashed. I rebuilt it and it looks as good as new.

My pony truss turntable is scratch-built of brass. Wouldn't you know it – just when I had finished my version, approximating its dimensions from photos, along came Diamond Scale Models with a kit for the same turntable. I did get some Diamond Scale parts for power and indexing the turntable, and 25 years later it all still works.

I built my own walkaround throttles from an article by Kirk Wishowski in the January 1986 MR. They have performed flawlessly since and are still in use. My first switch machines, by Kemtron, also work as good as new.

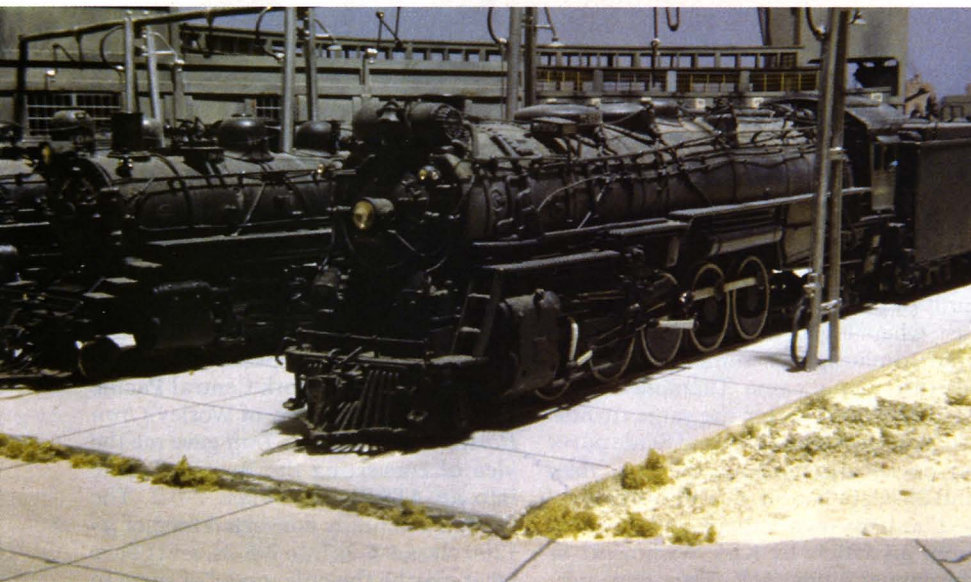
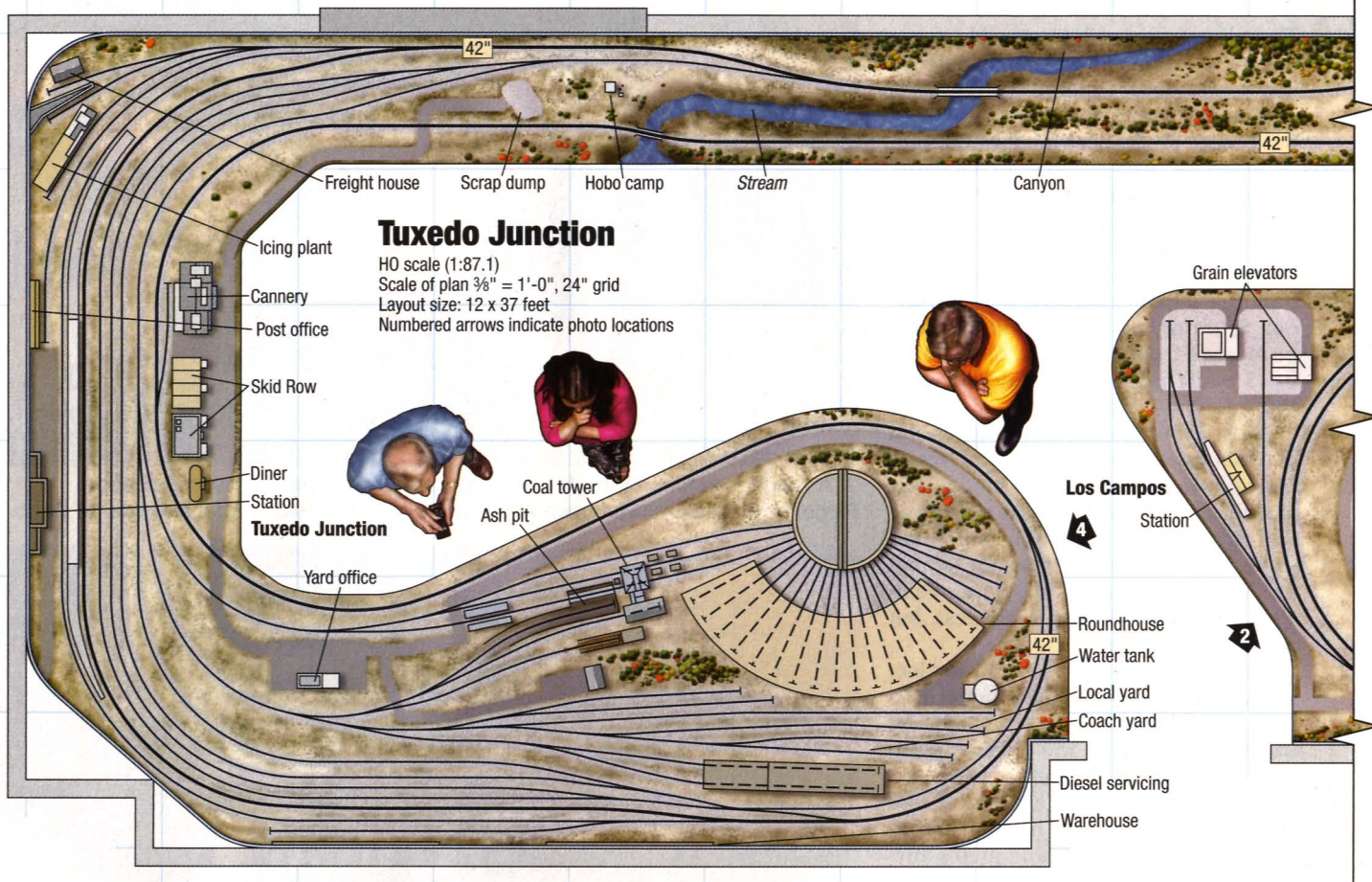
Years ago I bought brass Santa Fe locomotives as quickly as Pacific Fast Mail released them. As other importers came along, I bought other locomotives too, usually about one a year.

I also taught myself to scratchbuild locomotives in brass. The first two projects were junk, but good learning experiences. The biggest lesson learned is

that adhering to prototype dimensions is the single most critical task for the model to look right.

My fleet of Santa Fe steam locomotives was put together with some unusual twists. For example, someone gave me a Bowser New York Central Pacific kit. My well worn copy of Worley's *Iron Horses of the Santa Fe Trail* gave me the idea of converting the Bowser Pacific into an AT&SF 1200-class 2-6-2. The Santa Fe actually converted four of its 1200 class 4-6-2s into 2-6-2s, and I have what may be the only model of them in the world. Most die-hard SF fans would probably call me nuts for claiming it's authentic, but thanks to photographer Gordon C. Bassett, I have pictures to prove it.

I converted two Consolidations to 3100- and 3129-class 2-8-2s. A Frisco Russian Decapod became a 591-class 0-8-0. My Sierra 2-6-6-2 became a 1674-class 2-10-2. I scratchbuilt a 3800-class 2-10-2 with 20,000-gallon coal tender to go with my pair of United 2-10-2s.



4. The "Madame Queen," 2-10-4 no. 5000, waits on the storage tracks at Tuxedo Junction roundhouse. Roger swaps all motive power at Tuxedo Junction and runs a lot of double-headers to justify needing many different locomotives.

One of my favorite pieces of advice is to keep a good scrap box of parts that might have some future use. I have built a number of neat models from pure "junk."

In the early 1990s I undertook a project to rebuild my entire fleet, installing can motors with flywheels,

Hobbytown ball-and-socket universals, and as much detail as I could reasonably add. I also installed Modeltronics sound in all the steam locomotives. Just as I finished this grand rebuilding, DCC with sound became available. But my project was complete, so I have no reason to consider DCC.

► The layout at a glance

Name: Tuxedo Junction

Scale: HO (1:87.1)

Size: 12 x 37 feet

Prototype: Atchison, Topeka & Santa Fe

Locale: Southwestern U.S.

Era: 1952

Style: walk-in

Mainline run: 235 feet

Minimum radius: 32"

Minimum turnout: no. 8

Maximum grade: 2.5 percent

Benchwork: open grid

Height: 42"

Roadbed: cork

Track: code 83 flextrack

Scenery: hardshell

Backdrop: Masonite with commercial scenes

Control: cab control

Running the Tuxedo Junction

My time in the railroad industry taught me a lot about how trains operate. The most important rule is, in short, nothing moves unless it has a reason. Some of these reasons are based on customer demand, others on logistics (supporting power and crews

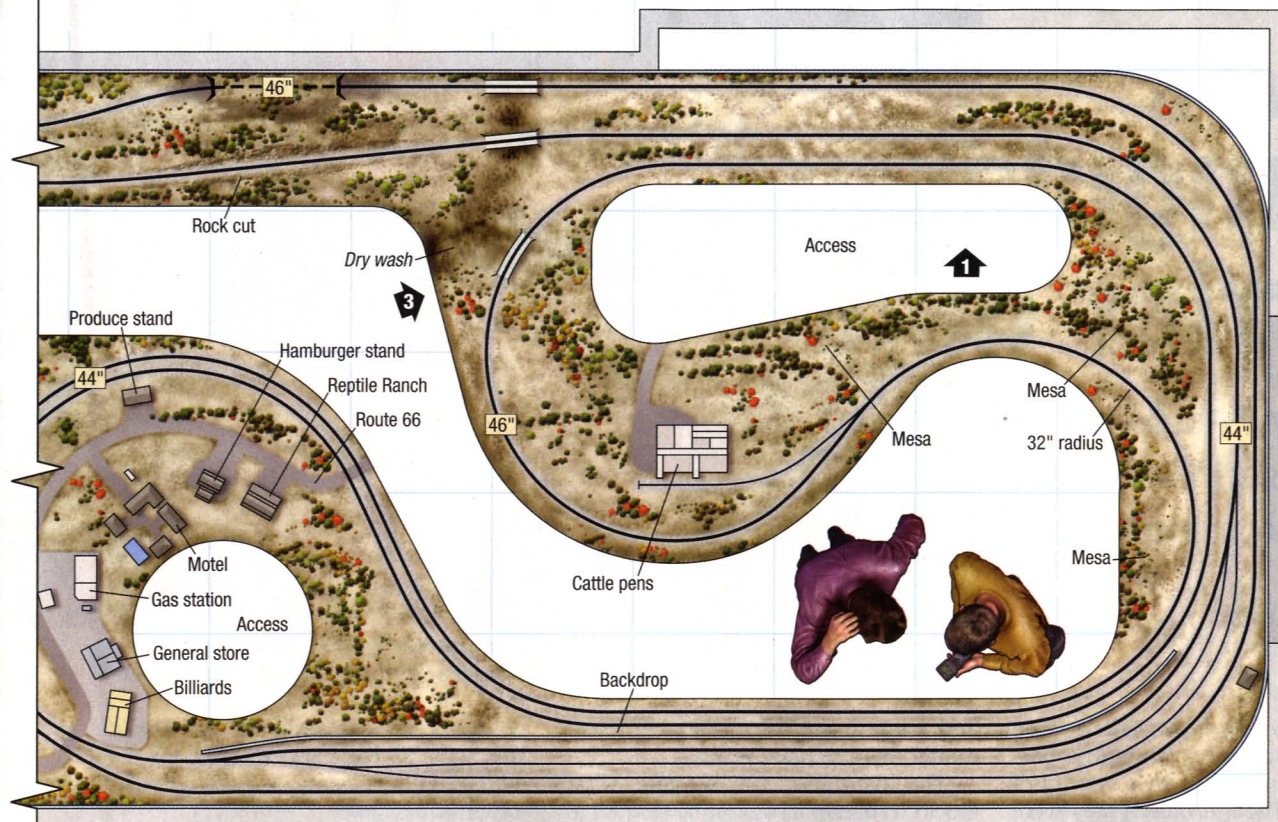


Illustration by Rick Johnson

or sorting cars based on destination), and yet others on labor rules. I wanted the same to hold true on my layout. For example, I should be able to set out a reefer for icing, pick it up and switch it to the fruit packing plant for loading, then pick up the loaded car and place it in a through train for road movement.

In short, I just wanted a layout that looked fairly authentic to the region and period, could be operated realistically, and would be fun to build and run. I devised an extensive operating plan that takes me over a month to complete before restarting.

As a train leaves Tuxedo Junction eastbound, it passes behind the "other side of the tracks" and a fruit packing plant, past a junkyard, a hobo camp and a trout stream, crosses a dry wash, curves around a couple of mesas, and passes into a staging yard. A west-bound train passes several industries, passes through a tunnel, crosses a dry wash, curves around mesas, disappears behind the staging yard, and reappears to enter Los Campos. This tiny town along Route 66 comes complete with tourist traps. The route continues through the Southwestern countryside, past cattle pens and eventually into the staging yard. (Yes, it does pass through Los Campos again on its way, but this

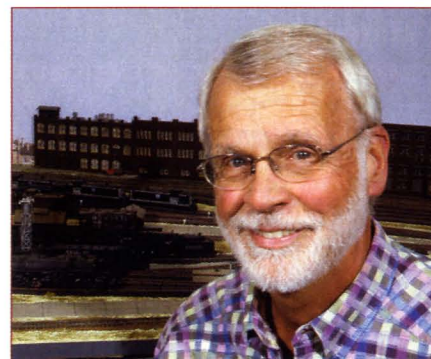
is just a model train layout. Pretend it's a different Los Campos.)

The staging yard should really be hidden, but getting it to fit in the train room meant greatly cutting the length of my mainline run or putting the yard behind a backdrop. I chose the latter. This backdrop has no sky, relying on another backdrop a few inches behind it to finish it off. You can still see the yard from some vantage points, but it does the job for me.

I admit the layout has a few problems. For one, it's too low, but the room's windows dictated that height. I wanted 36-inch minimum mainline radius, but had to settle for less. My aisles are too narrow in places, but I am usually the only operator, so I accept that limitation. And some equipment is out of period, but it's there because I like it.

A lifetime hobby

It's kind of odd to think of this as my last layout. On the other hand, after 57 years it's been a grand, grand run. As much as I love scratchbuilding steam locomotives, there aren't any more that I want to build. That's quite an accomplishment, I think. For now, I really enjoy operating the layout and adding that occasional little touch. Model railroading truly is a lifetime hobby.



Meet Roger Mehl

Roger Mehl was hired by the New York Central in 1968, but thanks to its merger with the Pennsylvania RR, his first day of work was for the Penn Central. He lives in southeastern Minnesota with his wife, Betsy, and their two dogs, a German shepherd and a Great Dane.

I still have the old Varney gondola I got with my cereal box tops. It's not quite up to today's standards, but it's very special to me. Assigned to permanent ash pit service, it seems to belong. I haven't been able to eat Kix since then, though. **MR**

Model a triangular barrier gate

This easy-to-build detail can be used for roads and rail crossings

By Joseph Kreiss

Photos by the author



A triangular barrier gate blocks a crossing on Joseph Kreiss' HO scale Big Island Rail layout. Follow along as Joseph shares his tips for modeling the gate.

From businesses to non-interlocked crossings to farms, triangular barrier gates are used in a variety of applications. Though older gates were constructed of wood (or wood with steel hinges), contemporary gates use all-steel construction. Most of these gates follow the same basic design. With floral stem wire, cyanoacrylate adhesive (CA),

and some basic tools, you can easily model them in one evening.

The inspiration for my gate, which blocks a road to a sugarcane field on my HO scale Big Island Rail layout, came from a photo of a South Central Florida Express RR freight shot at a private grade crossing. I estimated the size of the gate in the image and adjusted the

dimensions so they'd look appropriate at a scale 25-feet wide. Though my gate is HO scale, you can easily build one in other scales. **MR**

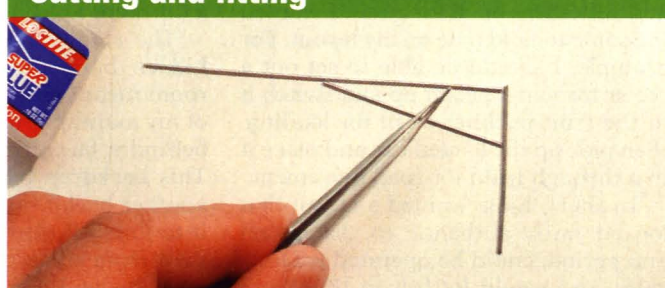
Joseph Kreiss lives in Salida, Colo. His article on crafting coconut palm trees appeared in the June 2008 issue of Model Railroader.

Materials



The key components for the triangular barrier gate are 18- and 20-gauge floral stem wire, which is available at most craft stores. In addition, you'll need wire cutters, a scale rule, tweezers, CA, a paint marker, and weathering powders.

Cutting and fitting



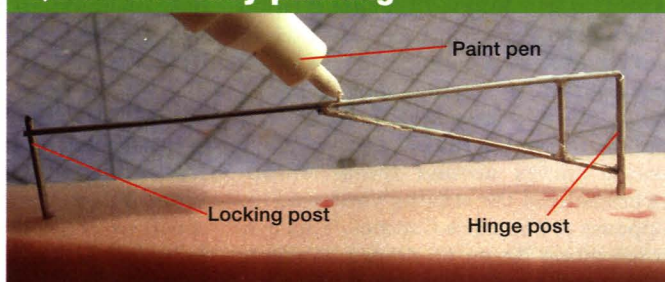
I cut the floral wire to length and test fit the pieces. I built the gate frame using 20-gauge wire. The hinge post and locking post (shown below) are 18-gauge wire. I cut the posts $\frac{1}{2}$ " longer at the bottom so I could mount them to the scenery.

Assembling the gate



I taped a piece of waxed paper to a cutting mat with a grid printed on it. I aligned the horizontal and vertical parts of the gate on the grid lines and cemented them with CA. After the CA dried, I gently pried the gate from the waxed paper.

Quick and easy painting



I temporarily mounted the gate on a piece of foam for painting. Once the paint was dry, I slightly bent the long cross arm to suggest damage from hard use. Then I lightly weathered the gate with powders from Bragdon Enterprises.



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Adding sound to older Athearn locomotives



Mike Polsgrove converted these old Athearn U30Cs to Digital Command Control. Mike Polsgrove photos

Though my layout is set in 1963, five years before the Soo Line purchased its General Electric U30C diesel locomotives, I occasionally run newer motive power on my model railroad. However, before I could run my direct current Athearn U30Cs that I painted back in the 1970s, I needed to upgrade them to Digital Command Control.

Measuring current. I started the decoder installation by making sure the motor wasn't drawing more current than the decoder could handle. This typically isn't a problem with newer models, but since I was working with older locomotives, I checked the current just to be safe.

I have a rotary switch on my test track that allows me to select between a direct-current power pack, the main line or programming

track from my DCC system, or stand-alone DCC programmers from a number of different manufacturers. I also have a RRampMeter from Tony's Train Exchange between the rotary switch and test track to measure voltage and current.

The two Athearn motors drew 1.3 and 1.8 amps. Since the Quantum Revolution decoders I wanted to use can only handle a steady state current of 1.3 amps, I replaced the factory motors with A-Line repowering kits. See **fig. 1**. Following the instructions, I replaced the motor and flywheels with those in the kit. Then I soldered the orange wire to the lower motor terminal.

The frame of the replacement motor isn't electrically connected to either of the motor terminals. To ensure the motor is isolated from the frame, I attached it to the A-Line cradle weight with double-sided foam tape. After repowering, each motor drew just .5 amps.

Sound and speaker. I love the burbling sound of the engines used in U30Cs, so I added a sound decoder. I've been eager to try QSI Solutions' Quantum Revolution sound decoders, and this was the perfect chance to use them. Drop-in (Revolution A) and wired versions (Revolution U) are currently available. Since my Athearn models predate the drop-in format, I purchased Revolution U decoders.

I mounted a small 8Ω oval speaker in the housing near the back of the shell. I soldered the two

violet wires, which come out of the opposite side of the decoder from the eight-pin connector, to the speaker terminals. I drilled a small hole in the back of the housing to accommodate the wires. Be careful when soldering wires to the speaker, as the magnet is strong enough to attract the tip of the soldering iron. It's easy to ruin the speaker cone with a hot soldering iron.

Wiring the decoder. Both trucks pick up current from both rails. The right-hand rail is electrically connected to the steel strap on each truck. The left-hand rail is connected to the frame.

The QSI Solutions decoder includes an eight-pin plug that's connected to the decoder's function, pick up, and motor control wires. Since there's no corresponding socket on the Athearn locomotive, I cut the plug off.

As shown in **fig. 2**, the decoder has two red wires. One goes to the eight-pin plug; the other goes to a capacitor. I soldered the red wire attached to the plug to the steel strap on one truck, and soldered a jumper wire from one truck strap to the other. This allows all six wheels on the right rail to provide power to the decoder.

There are also two black wires attached to the decoder. As before, one is connected to the eight-pin plug and the other is attached to the capacitor. I soldered the black wire that was originally connected to the plug to the steel clip that

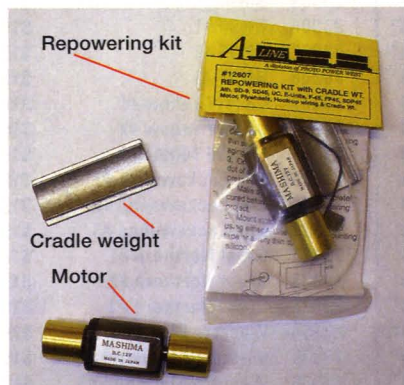


Fig. 1 New motor. The A-Line motors drew .5 amps each, much lower than the 1.3 and 1.8 amps drawn by the old Athearn motors.

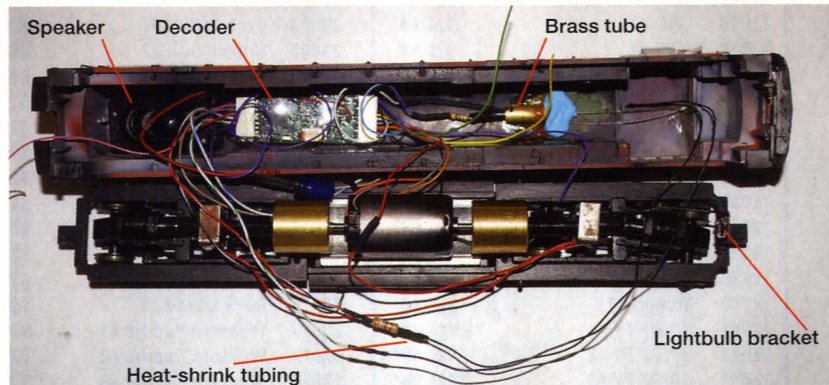


Fig. 2 Wiring the decoder. This photo shows the locomotive with the new motor, decoder, and speaker all installed. To reduce the likelihood of short circuits, Mike covered all of the exposed wires and electrical connections with heat-shrink tubing.

once held the lightbulb in place. It's difficult to solder a wire directly to the zinc-alloy frame, so if your locomotive doesn't have a headlight clip, drill and tap a hole in the frame for a brass 2-56 screw and solder the wire to it.

I then connected the orange and gray wires from the decoder to the motor terminals. Since I'd already soldered an orange wire to the bottom motor terminal, I spliced that wire to the orange wire from the decoder. I soldered the gray decoder wire to the top motor terminal.

Lighting. Old Athearn locomotives have a 12-volt lightbulb in the middle of the cab that illuminates the front headlights and number boxes. I removed the headlight and plastic light pipe and number boards. I made new number boards from styrene, and fashioned new headlight lenses a .030" fiber optic strand, as shown in **fig. 3**. I flared the end of the strand by holding it close to (but not touching) the tip of a soldering iron.

I used a white light-emitting diode (LED) to illuminate the headlight. First, I cemented a short length of brass tube to the inside of the shell with Walthers Goo. Then I put the LED in one side of the tube and the fiber optic strand in the other. The Miniaturics LED I chose had the proper current-limiting resistor (470Ω) for 12V, so I connected both the diode and resistor between the blue and white wires. The flat side of the LED is the cathode and must be connected to the white wire.

The Soo Line U30Cs also had rotary beacons on top of the cab. A 1.4mm, 1.5V lightbulb fit perfectly in the Details West cored beacon. The Quantum Revolution decoder has a +5V (white-striped red wire) common, in addition to the +12V common (blue) wire. This allows the dropping resistor for the 1.5V bulb to be a lower value. I used a 150Ω resistor in series and connected the bulb and resistor between the +5V common and the green-striped white wire.

Configuring the decoder. I used the Quantum Programmer to test both decoder installations before putting the shell back on the frame. The programmer features a



Fig. 3 New headlights. Mike used .030" fiber optic strands to make new headlight lenses.

command station mode that's capable of running several locomotives at once. Using the Q2Upgrade software I downloaded from www.qsisolutions.com, I was able to check the function of the decoders using the "Retrieve Locomotive Information" option.

To change the decoder's programmed sound to that of a GE locomotive, I downloaded the U28/U30 sound file and loaded it into the Q2Upgrade program. From there I was able to customize other effects, such as changing the air horn to a Leslie S3.

I then used the "Configure Light Ports" button to assign the Overhead Beacon Light to port 5. I clicked the "Upgrade Locomotive" button to download the information into the decoder while the locomotive was on the test track. Upgrading the decoder takes a few minutes, so wait until it's complete before moving the locomotive.

I ran the locomotives on my test track using the Quantum Programmer to make sure the various sounds and lighting effects worked. The beacon came on with the headlight, and the sound volume was just how I wanted it. However, the locomotive ran backwards, so I used CV29 to reverse its direction.

Many of us have older DC locomotives. Thanks to modern decoders and software, these models no longer have to be relegated to the display case or a closet. Instead, they can be upgraded with realistic sound and lighting effects, taking full advantage of the capabilities of DCC. **MR**

Send your questions about Digital Command Control to DCC Corner, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail dcc@mrmag.com. We regret we can't answer all the questions we receive.

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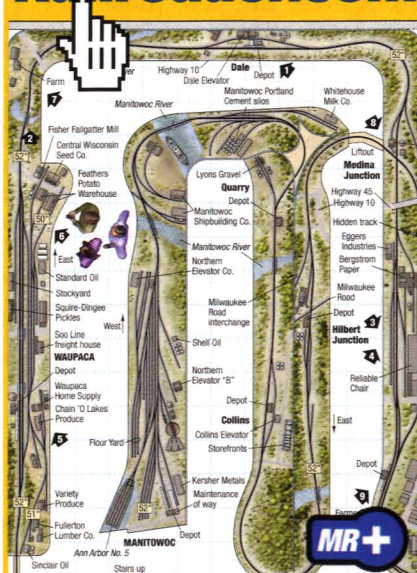
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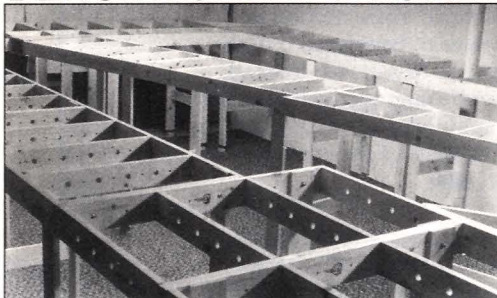
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Product Reviews



Smoke and sound highlight this HO scale Union Pacific 4-12-2 steam locomotive

An HO model of the world's largest rigid-wheelbase locomotive is available from M.T.H. Electric Trains. The HO 4-12-2 has realistic sounds and smoke that make it a lot of fun to operate, especially on a Digital Command Control (DCC) or M.T.H. Digital Command System layout. And the engine can negotiate 22" radius curves.

Prototype. Between 1926 and 1930 the American Locomotive Co. delivered 88 4-12-2 steam locomotives to the Union Pacific RR. The massive three-cylinder engines could haul 125-car freight trains at 50 mph.

The 4-12-2's two outside cylinders directly powered the third axle, while a cylinder mounted between them directly powered the second axle.

The third cylinder helped the engine deliver greater power more evenly. The arrangement produced more power without the need to increase the size of the cylinders. The smaller cylinders let the engine meet clearance requirements.

The unique locomotives hauled fast freight (and in emergencies passenger trains) into the 1950s.

Appearance. Most of the dimensions of the M.T.H. model match prototype drawings in *Model Railroader Cyclopedia Vol. 1: Steam Locomotives*. The model has scale 64"-diameter drivers, while the prototype had 67" drivers.

The backhead is also about a scale foot farther back than shown in drawings, so the cab interior is more cramped than the prototype. The cab interior has painted crew figures, window glazing, and a folding cab apron.

The locomotive and tender are made primarily of die-cast metal and represent no. 9000 during the last decade of her career. Separately applied parts include a Worthington SA feedwater heater, which replaced Worthington BL feedwater heaters on 4-12-2s beginning in 1944. The UP installed New York Air Brake Co. sanders on no. 9000 after World War II, and these are separately applied parts on the M.T.H. model.

All the aluminum (silver) lettering is correct and crisply printed. Small printing is legible and matches the prototype. One discrepancy is that the "11-11-48" inspection and "18,000 GALS."

stencil are printed over a molded-in wiring conduit instead of behind it.

Mechanism. A can motor with a brass flywheel is housed inside the boiler. The motor is connected to gearboxes on the third and fifth axles. Both drivers on the fifth axle have traction tires.

Unlike its prototype, the frame of the model is hinged between the third and fourth axle. There's an elongated slot in the side rod, connected to the third axle. This allows the pin connecting the eccentric crank and third driver to slide back and forth as needed when the model rounds a curve.

A user-installed chassis-locking plate is included with the model. Once installed the frame is rigid, but the minimum radius required to run the engine increases from 22" to 42". Installing the locking plate requires removing the top half

More on our Web site

Subscribers can watch us run the smoke- and sound-equipped HO scale M.T.H. 4-12-2 on our layout. Go to www.ModelRailroader.com

80 Atlas N scaler GE Dash 8-40CW
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86 Rapido N scale lightweight coach
 Walthers HO "Michigan" ore cars
88 TCS drop-in DCC decoder
 ExactRail HO PC&F boxcar

Dana Kawala



The tender has an operating backup light and warning light.

of the boiler. A video on the M.T.H. Web site shows the installation.

Like the prototype, the model has operating Gresley valve gear, and a center main rod connected to the second axle.

Metal contacts inside the locomotive's drawbar make a wireless connection to a pin on the tender. Additional electronics and a speaker are inside the tender. An on/off switch for the smoke unit is

under the rear water hatch, and a master volume knob is under the center water hatch.

Performance. The model ran well in DCC and DCS modes and accelerated to 75 scale mph, which is close to the prototype's top speed. Using 128 speed steps in DCC, the 4-12-2 smoothly crept along at .5 scale mph.

In DC the lights and sound came on at 7 volts, and the model started moving at 8 volts. Although our standard speed test for DC goes up to 12 volts, the instruction manual states that the 4-12-2 will reach a prototypical top speed at 16 volts.

I ran the model through no. 6 turnouts and crossovers in the yard on our layout. The 4-12-2 didn't derail, and the sounds and lights remained constant.

Sounds and smoke. In DCC, the model has 28 user-controlled functions, including the whistle and bell. Function 4 triggers a water stop sequence, complete with a multi-part dialog between the engine crew. Function 5 turns on the cab interior light and the red marker lights and warning light on the tender.

The model's 10 programmable configuration variables include the long address and acceleration and deceleration rates. The model can only be programmed on the main.

I also accessed all the locomotive's functions using an M.T.H. DCS Digital Commander.

In DC, sounds and smoke are limited to automatic features, such as the chuffing sounds and operating smoke.

The sounds include the correct six chuffs per wheel revolution. (The third cylinder accounts for the additional two chuffs.) The operating smoke unit is synchronized to the chuffing sounds and the motion of the drivers. This feature is especially noticeable at slow speeds when thick, distinct puffs of white smoke shoot out of the smokestack.

Although the model reflects some compromises to allow it to negotiate 22"-radius curves, the M.T.H. 4-12-2 Union Pacific type is

►► M.T.H. HO scale 4-12-2

Price: \$549.95

Manufacturer

M.T.H. Electric Trains
 7020 Columbia Gateway Dr.
 Columbia, MD 21046-1532
www.mthhotrains.com

Road numbers: (all Union Pacific) nos. 9000, 9010. Numbers 9503 and 9512 also have Oregon Short Line (O.S.L.) markings

Era: detailed for mid-1940s to 1956

Features

Automatically switches between DC, Digital Command Control, and M.T.H. Digital Command System modes
 Constant brightness headlight and backup light
 Electrical pickup on 10 drivers and all tender wheels
 Engine and tender weight: 2 pounds 2½ ounces (Engine alone: 1 pound, 5.5 ounces)
 Fan-driven smoke unit
 Five-pole skew-wound motor with brass flywheel
 Metal RP-25 contour wheels in gauge
 Minimum radius: 22"
 M.T.H. Proto-Sound 3.0 system operates on DC, DCC, and DCS
 Optional drivers without traction tires
 Sprung drivers
 User-installed operating magnetic knuckle couplers at correct height

MTH HO 4-12-2

Drawbar pull		10.5 ounces	
		150 HO freight cars	
Scale speed (DC)		Scale speed (DCC)	
Volts	Scale mph	Speed step	Scale mph
8 (start)	1	1	4
10	15	7	30
11	30	14	59
12	40	28	75
Current draw at 12 volts (DC)		Slipping	.5A
		Stalled	.6A

an impressive model of a uniquely UP prototype. — Dana Kawala, *associate editor*



N scale General Electric Dash 8 is a smooth performer in DC and DCC

N scalers who model the modern day should be happy with Atlas' new release, General Electric's Dash 8-40CW road engine. Atlas' offering is a well detailed, crisply painted model with a smooth, flywheel-equipped drivetrain and an optional Digital Command Control (DCC) decoder.

The prototype. Seen by some railfans as the first third-generation diesel locomotive, the Dash 8-40CW – usually referred to by its owners as C40-8W – was built at GE's upgraded Erie, Pa., plant starting in December 1989. What made the Dash 8 series so revolutionary, and allowed GE to outsell rival Electro-Motive Division for the first time in its history, was the marriage of the high-horsepower 7FDL16 engine and 752AH traction motor with computerized controls.

The "C" in C40-8W denotes three powered axles per truck, while the "40" refers to the locomotive's 4,000-hp engine. The "W" stands for "wide," referring to the North American Safety Cab. The locomotive was GE's first to have that cab, which was distinguished from the slightly earlier Canadian Comfort Cab by different front windshields and nose profiles.

Union Pacific, which was the first railroad to order the C40-8, was also the C40-8W's first buyer, receiving the first of 50 in December 1989. Conrail bought 50 of the wide-nosed units in 1990, and others were later sold to CSX and

the Atchison, Topeka & Santa Fe. Atlas offers its model in all four road names, with three road numbers each. Our sample came painted in the Santa Fe's red-and-silver warbonnet scheme.

Outside and in. With its wide cab and flying-wing radiator enclosure, the Dash 8-40CW cuts a distinctive figure on the rails. Atlas captures that look with a finely molded plastic body shell that matches the dimensions of prototype drawings in the September 1997 issue of *Model Railroader*.

The paint on our sample is crisp, with sharp and even yellow-and-black striping separating the red and silver portions. The livery matches photos of Santa Fe no. 804 that I found on the Internet, down to the numerous tiny warning signs on the sills and access doors. Those signs bear some of the smallest legible print I've seen on a model. The large "Santa Fe" on the sides of the hood, however, has a number of voids where the lettering crosses panel edges or door handles.

The flexible plastic handrails are two N scale inches in diameter. Other details include the separately applied bell and horns, cab sunshades, m.u. hoses, coupler cut levers, and wire nose grab irons.

The magnetic knuckle couplers are body-mounted, so I was able to lift off the shell without having to remove any screws. In the middle of the split die-cast metal frame is an open-frame, five-pole, skew-

wound motor with dual brass flywheels. Power is transmitted to the middle axles of both trucks by brass worm gears, and gears on those axles drive the other wheels. All 12 chemically blackened metal wheels also pick up electricity.

The DCC decoder rests in a recess on top of the frame. Plastic light rods conduct light from light-emitting diodes (LEDs) on both ends. A small separate circuit board on the front of the frame has two surface-mount LEDs that, through a similar arrangement, illuminate the ditch lights. These can be controlled with the DCC throttle to be on, off, or blink alternately.

DC and DCC operation. Our model came equipped with a dual-mode DCC decoder. Upgrading to a sound decoder doesn't seem like a practical idea, because there really isn't room to add a speaker without removing vital parts of the frame.

I tested the locomotive both under direct current and Digital Command Control. In DC, the locomotive started moving about 5 volts (V), rolling at a respectably slow 3 scale mph. At 12V, the model topped out at 124 scale mph, considerably higher than the locomotive's 70 mph upper limit.

When I tried the model in DCC, it didn't start moving until the throttle reached speed step 7. After I programmed the decoder's starting voltage (Configuration Variable 2) to 55, it rolled steadily at 5 mph at speed step 1. At speed

► N scale GE Dash 8-40CW

Price: Direct-current model, \$139.95; with Digital Command Control, \$179.95

Manufacturer

Atlas Model Railroad Co.
378 Florence Ave.
Hillside, NJ 07205
www.atlasrr.com

Road names: Atchison, Topeka & Santa Fe (red-and-silver warbonnet); Conrail ("Quality" scheme); CSX; and Union Pacific. Also available undecorated, in three body styles.

Era: 1989-present

Features

Accumate magnetic knuckle couplers (body-mounted, at correct height)
All-wheel drive and electrical pickup
Blackened wheels (in gauge)
Directional light-emitting-diode lighting
Ditch lights (controllable in DCC)
Five-pole skew-wound motor with dual brass flywheels
Weight: 3.2 ounces
Wire grab irons on top of nose (molded on elsewhere)

Atlas N scale Dash 8

Drawbar pull	.96 ounces
	23 N freight cars

Scale speed (DC)		Scale speed (DCC)	
Volts	Scale mph	Speed step	Scale mph
5 (start)	3	1	5
6	20	7	11
9	72	14	28.5
12	124	28	98.5

Current draw at 12 volts (DC)	Slipping	.21A
	Stalled	.36A

step 28, it reached 98.5 mph. I also tried it with the throttle set to 128 speed steps, which gave me more control at low speed.

I also tested a few other DCC functions, changing the decoder's address to the cab number and turning the lights on and off.

Atlas' new Dash 8-40CW would be a fine addition to a modern diesel roster. Two or three of these sharp-looking models would look great hauling a long intermodal train on a contemporary layout. — Steven Otte, associate editor

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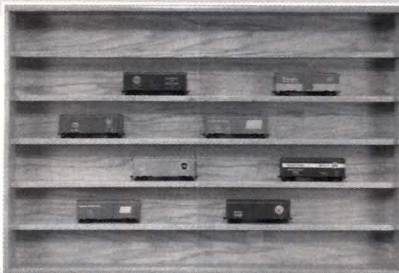
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BLMA Models enters freight car market with ready-to-run Top Gons in HO and N

A Norfolk Southern class G85R Top Gon coal gondola is the first freight car offering from BLMA Models. The ready-to-run cars are available in HO and N scales and have road number-specific load limit, light weight, and "rebody" date stencils.

Prototype history. Norfolk Southern's Roanoke, Va., shops started its "rebodying" program in 1991, when it rebuilt two Norfolk & Western open hoppers into NS class G84 coal gondolas. The first G85R class cars, which the BLMA Models gondola is based on, were built in July 1992 from N&W class H11, H11A, H11B, H11C, and H12A hoppers.

Though the center sill was retained during the rebodding process, the bays, doors, and door-operating equipment were replaced with a flat-bottom tub floor. It's because of the tub floor these cars are classified as gondolas instead of hoppers. More than 2,200 G85R gondolas were rebuilt by the railroad between 1992 and 1998.

The models. Both models have smooth and evenly applied light gray paint. The lettering and logos are all sharp. Even the PULL lettering on the corner posts of the N scale gondola is legible under magnification.

The HO and N scale models use one-piece plastic bodies with die-cast metal center sills and weights above the trucks. Both cars have crisp rivet detail, internal braces, and separately applied brake wheels with see-through brake platforms. The car interiors have ejector-pin marks where they were released from the mold.

The gondolas have separately applied end braces on the A and B ends and an air reservoir, brake cylinder, and triple valve on the B end only. The HO scale car has wire grab irons and uncoupling levers; the N model uses molded grabs and lacks uncoupling levers.

Both gondolas have 100-ton trucks. The N scale gondola uses plastic wheelsets and truck-mounted Accumate knuckle couplers. The HO car has metal wheels mounted on plastic axles. The wheels on the B-end HO truck were slightly out of gauge. I was able to fix this by carefully twisting the wheels on the axle.

The length over the strikers, distance over the top side angle, and truck wheelbase all match prototype drawings.

The HO and N scale Top Gons are both fine cars. With 36 road numbers available, Norfolk South-

BLMA HO and N Top Gon

Price: \$25.95 (HO), \$17.95 (N)

Manufacturer

BLMA Models
16623 Pear Blossom Ct.
Whittier, CA 90603
www.blmamodels.com

Era: 1992-present

Road name: Norfolk Southern
(36 road numbers)

Features

- Automatic Equipment
- Identification tags
- Magnetic knuckle couplers:
 - Kadee no. 58 (HO), Accumate (N). Both mounted at correct height
- Molded grab irons (N)
- Weight: HO scale 3 ounces (1.25 ounces too light), N scale .5 ounces (.5 ounces too light)
- Wheelsets: metal on plastic axles (HO), plastic (N)
- Wire grab irons and uncoupling levers (HO)

ern modelers can build a unit coal train with minimal effort. Congratulations to BLMA Models on its first freight car offering. Look for its G-86R gondolas in HO and N scales later this year. — *Cody Grivno*, associate editor

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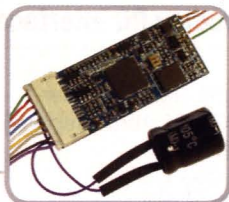
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Computer interface is a useful tool for MRC Prodigy DCC users

Model railroaders who use a Model Rectifier Corp. Prodigy, Prodigy Express, Prodigy Advance, or Prodigy Advance Squared Digital Command Control (DCC) system can now use their desktop or laptop PC home computers as a Prodigy Advance Squared throttle. While you can use the MRC Prodigy computer interface to run trains, I found that the product is most useful for programming mobile and stationary DCC decoders.

Easy set up. The cable version of the Prodigy PC interface includes a cable that connects the USB port of a PC to a command port on a Prodigy-equipped layout. The wireless version includes a wireless transmitter that plugs into the USB port on a PC, as well as a Prodigy wireless receiver.

This receiver also allows you to use Prodigy Advance wireless DCC throttles (available separately). If you already have a Prodigy wireless DCC system, you don't need this component and can purchase the wireless transmitter separately (manufacturer's suggested retail price, \$69.99).

I tested the wireless version with a laptop running Microsoft Windows XP. I downloaded and installed the drivers for the interface at the MRC Web site. Following the instructions and onscreen menus, I installed the necessary software in a couple of minutes. It's important not to remove the USB transmitter from your computer during the installation process.

Drivers are also available for Windows Vista, and users without Internet access can purchase a CD copy of all the necessary software for \$15.00. As of this writing there isn't any software available for Apple Macintosh computers.

Running trains. After you assign the PC a unique cab number, a screen is displayed with controls for two individual throttles. The screens are easy to use, with fields for locomotive addresses and onscreen buttons for 28 functions and locomotive direction. The recall

stack for each throttle saves up to 25 locomotive addresses.

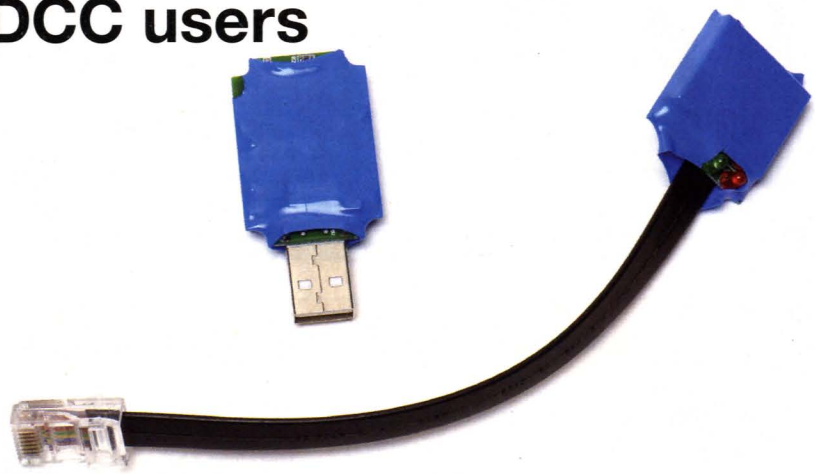
This screen offers the same control options as two Prodigy Advance Squared throttles, as well as additional user-friendly features. You can also control six stationary decoders from this screen.

There's a roster page where you can assign locomotive addresses, road names, and numbers. This feature allows you to then select each locomotive by road name from the saved list.

I ran two locomotives on our layout using the system. When I clicked on a function, there was a delay of about a half-second before the locomotive responded. The system operated most reliably when the PC was within 20 feet of the wireless receiver.

Easy programming. The intuitive screens make it easy to quickly program multiple configuration variables (CVs). From the Easy Program screen I changed a locomotive's address, set acceleration and deceleration rates, and changed the starting and top voltage. Other screens that allow advanced programming are just as easy to use.

From the CV Blaster screen you can program all of a decoder's supported CVs at the same time. For decoders with a CV read-back feature, all the CVs on the decoder will display on the screen when the system is connected to a programming track. I also used this screen's "Fxx Mapping CV36 - CV46" button to access another screen to remap



▶▶ MRC Prodigy PC interface

Price: \$79.98 (wireless interface), \$59.98 (cable interface)

Manufacturer

Model Rectifier Corp.

80 Newfield Ave.

Edison, NJ 08837

www.modelrectifier.com

function 2 so that the bell on the locomotive would ring whenever the whistle blew.

I especially appreciated the "Speed Table CV67-CV94" screen accessed from the CV Blaster. A locomotive's speed curve is displayed as a line graph, and you can adjust the speed curve by simply pulling points on the graph up or down. This is a lot less tedious than using trial and error to enter values in individual CVs.

With the Consist Manager screen you can set up advance consists and save them by name. At the Route Manager screen you can program and save turnout routes for stationary decoders. You can also set up a fast clock on the PC.

Your locomotive rosters, as well as your CV settings for each locomotive, can be saved as computer files. You can then share these files with other MRC computer interface users.

While I still prefer running trains with a handheld throttle, this computer interface makes programming decoders a much easier task and is a great addition to the MRC Prodigy DCC system. — D.K.


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Product Reviews

▶▶ Rapido N scale Canadian lightweight passenger cars



Price: \$47.95 each

Manufacturer

Rapido Trains Inc.

140 Applewood Crescent, Unit A
Concord, Ont., Canada L4K 4E2
www.rapidotrains.com

Era: 1952 to present day

Comments: These new N scale lightweight passenger cars from Rapido Trains are some of the best-detailed commercial models I've seen. Each plastic car comes assembled and ready-to-run with body-mounted Micro-Trains magnetic knuckle couplers, interior and underbody details, battery-powered lighting, and etched brass vestibule end gates.

The model shown here is an 80-seat coach. A type E sleeper with 4 sections, 4 bedrooms, and

8 duplex roomettes is also available. Both models represent Canadian National prototypes from the 1954 delivery of smooth-side cars that rode on four-wheel roller-bearing trucks. The cars will operate on 11" radius curves.

These models closely follow the same construction and excellent detailing used on the Rapido HO models reviewed in the January 2007 *Model Railroader*. The clear window glazing has raised and plated sashes that fit into the openings to reproduce the prototype's flush-mounted windows. Our samples came neatly painted in realistic colors, and multiple car names or numbers are offered in all 28 road names. — *Jim Hediger, senior editor*

▶▶ Walther's HO scale "Michigan" ore cars

Price: 12-car limited-run sets, \$169.98

Manufacturer

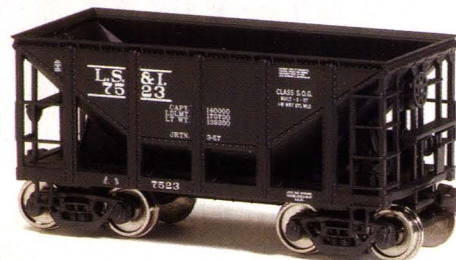
Wm. K. Walther's Inc.

P.O. Box 3039
Milwaukee, WI 53201
www.walthers.com

Era: 1942 to present day

Comments: These short ore cars were designed and built in large numbers to haul heavy loads of iron ore in Michigan's Upper Peninsula. Even though their 24-foot length is the same as the newer "Minnesota" cars, these "Michigan" ore cars are taller and about a foot narrower to fit on Michigan's older ore docks.

Each ready-to-run model consists of a well-detailed plastic carbody, a cast zinc alloy underbody, and separately applied hopper bracing and brake system details. With its exposed vertical ribs and different proportions, this model looks distinctly different from Walther's "Minnesota" cars.



Our Lake Superior & Ishpeming cars included the correct five-foot wheelbase trucks fitted with metal RP-25 contour wheels mounted in gauge. The end cars in the set have Proto Max metal knuckle couplers on one end, but the other cars have dummy couplers.

The limited-run 12-packs have individual car numbers and come decorated for Chicago & North Western (two different sets); Duluth, Missabe & Iron Range; Great Northern; Lake Superior & Ishpeming; Soo Line; and data only (brown). High-side taconite versions of the car are also due shortly. — *J.D.H.*

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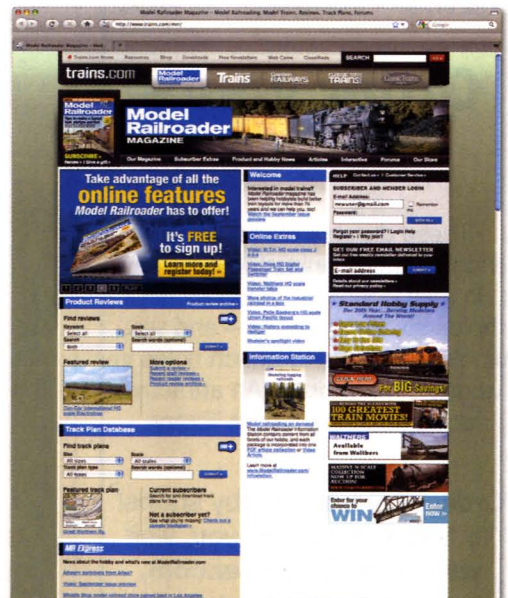
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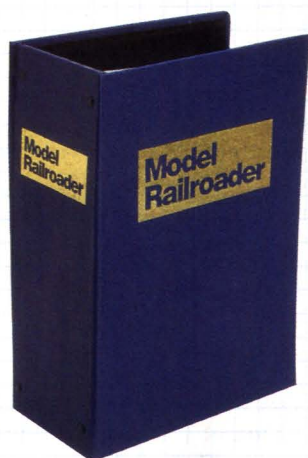
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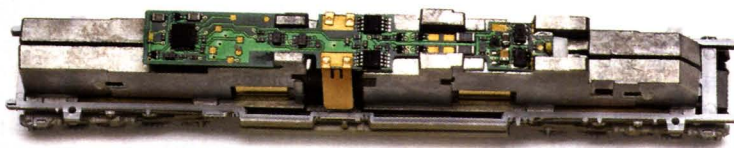
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Product Reviews

▶▶ TCS drop-in N scale DCC decoder



Price: \$39.95

Manufacturer

Train Control Systems

P.O. Box 341

Bloomington, PA 18911

www.tcsdcc.com

Comments: This drop-in Digital Command Control (DCC) decoder from Train Control Systems fits the Kato N scale SD70ACe, GG1, and SD40. The TCS K1D4-NC decoder controls motor and lighting functions and has two light-emitting diodes (LEDs).

Installation instructions are on the TCS Web site. On my first attempt to install the decoder, it didn't make contact with the frame, so it didn't function. After removing the decoder, I added solder to the front contacts to increase their thickness and installed it again. When that also

didn't work, I added a shim made of .030" styrene under the front of the board to wedge the front contacts tightly against the frame. The decoder now works perfectly.

I was especially impressed with the decoder's excellent slow speed control. In speed step 1 the SD70ACe crept smoothly at less than 1 scale mph. The top speed was 200 scale mph, much too fast to be prototypical. I set CV5 (top voltage) to 90, and now the model runs at a much more realistic 75 scale mph top speed.

I programmed the decoder on the main as well as a programming track without difficulty.

Although installation took a little extra effort, the K1D4-NC decoder is a great choice for converting a Kato N scale SD70ACe to DCC. — D.K.

▶▶ ExactRail HO scale PC&F 6,033-cubic-foot-capacity boxcar



Price: \$24.95

Manufacturer

ExactRail

1053 South 1675 West

Orem, UT 84058

www.exactrail.com

Era: 1965-present

Comments: The prototype for this hi-cube boxcar was built by Pacific Car & Foundry during the 1960s for transporting appliances.

The model uses separately applied ladders, stirrup steps, and etched-metal crossover platforms. The underframe has a molded plastic low-pressure hydraulic cylinder and brake detail.

ExactRail offers the car with prototype-specific ASF Ride Control or Barber S-2 trucks. The 33" metal wheelsets are in gauge. The McHenry no. 41 knuckle couplers are at the correct height, but the trip pins are too low.

The model closely matches dimensions in the January 1972 *Official Railway Equipment Register*. It weighs 4.2 ounces, which is .3 ounces too light based on National Model Railroad Association recommended practice 20.1.

Available in six paint schemes, this HO boxcar is a great looking model of its prototype. — C.G.

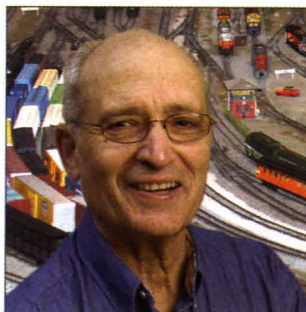
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Trackside Photos



Three Burlington Northern Santa Fe locomotives thunder across a bridge spanning a ravine on Pete Duchene's N scale BNSF BenZach Subdivision layout. Pete, who shot the photo, says he favors N scale because it allows a high ratio of scenery to track.

Want to see your work in Trackside Photos?

Trackside Photos is a showcase for the work of *Model Railroader* readers. We encourage contributions. Send your photos (original color slides or digital images 5 megapixels or better on CD-ROM) to: *Model Railroader*, Trackside Photos, P.O. Box 1612, Waukesha, WI 53187-1612. Include caption information, such as a description of what's going on in the picture; the name, scale, era, and locale of the layout; and information about the rolling stock or structures pictured. For a copy of our photo submission guidelines, contact editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrmag@mrmag.com.



Missouri Pacific no. 3169 emerges from the tunnel at Reeds Spring, Mo., in an HO scale diorama built by Bob Plough of Wentworth, Mo. The Electro-Motive Division SD40-2 is an Athearn model Bob painted and detailed. He photographed the scene outdoors in natural light.

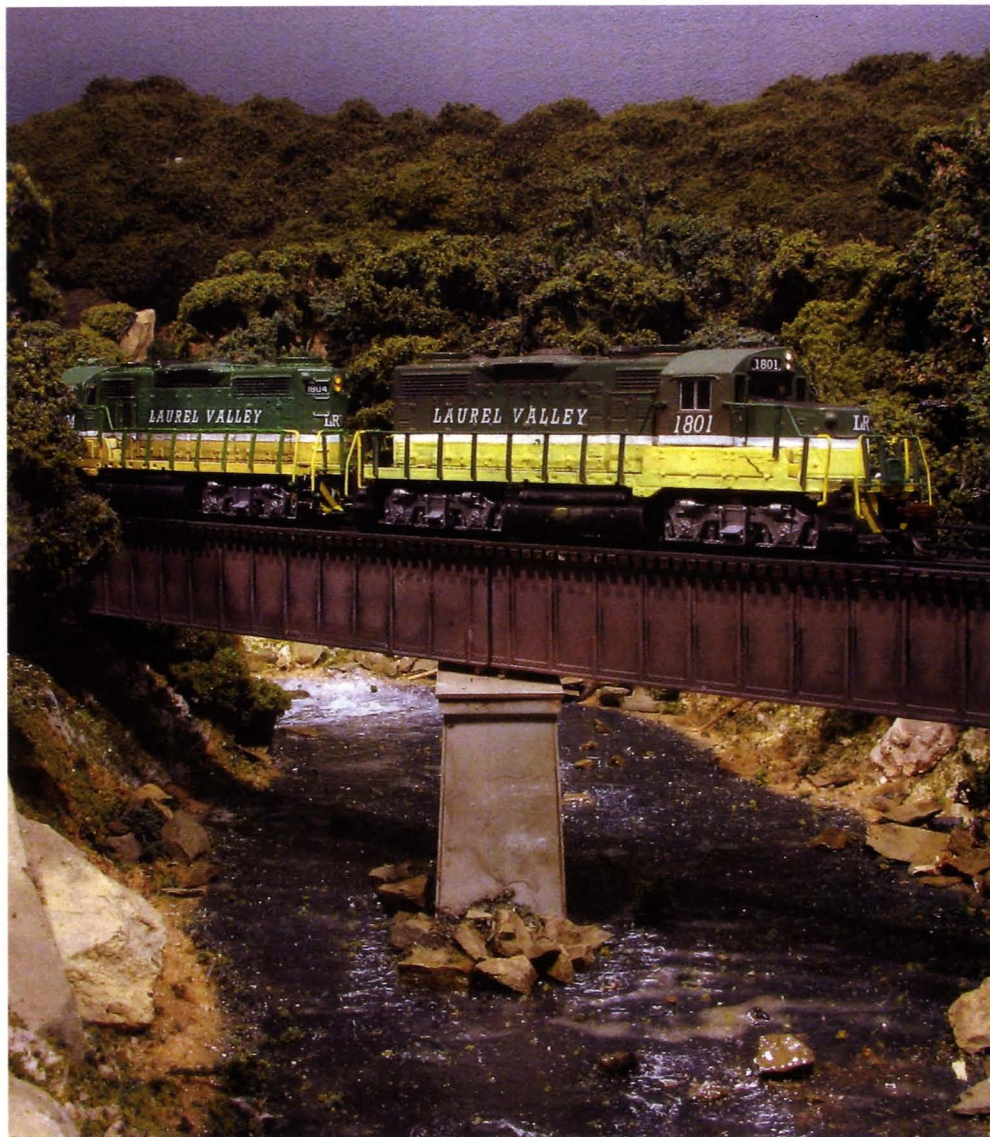


A tired 2-8-2 Mikado pulls the daily local peddler through the woods near Holly Springs on its way to Ukiah, Calif., and an interchange with the Northwestern Pacific. The action takes place on Ken Kirkwood's HO scale Ma & Pa K Ry., a freelanced California short line. Ken, of Yucaipa, Calif., took the photo.





An empty tank car is used as a switching handle to shove a neglected 4-4-0 up a temporary ramp onto a flatcar for its last trip down the rails. The antique American is on its way to a railway museum, where it will be restored for display. Volker Lange of Grosspörsna, Germany, staged the scene on his HO scale layout.



Laurel Valley Extra 1801 West, led by a pair of Electro-Motive Division GP18s, crosses the Casselman River on its way to the Western Maryland junction at Rockwood, Pa. Lee Weldon's Laurel Valley is a freelanced N scale line set in Maryland and Pennsylvania. Lee shot the photo.



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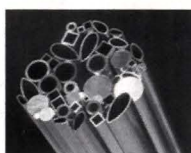
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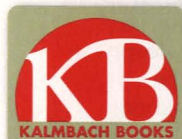
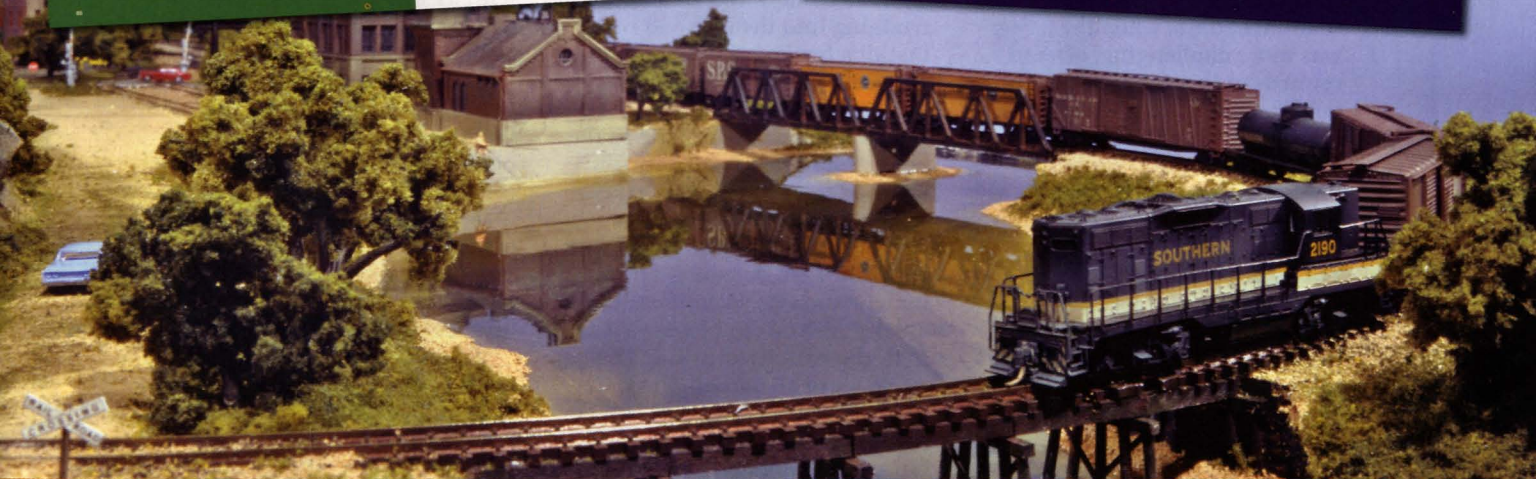
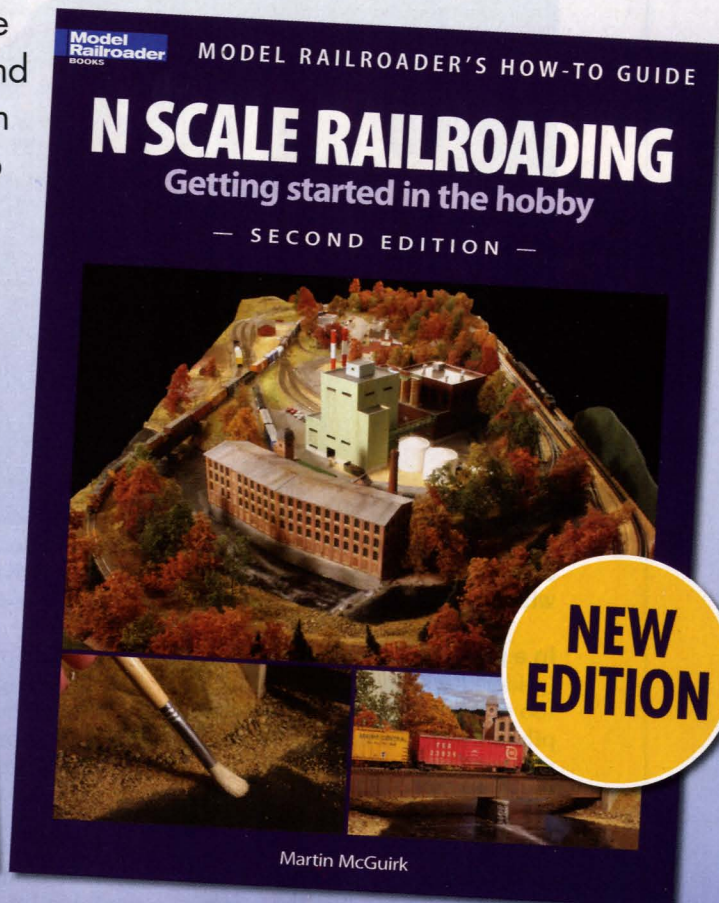
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Waiting for the perfect day

Tony Koester



An operating crew will bring a wide variety of talent, experience, and opinions to your railroad, so prepare for their arrival diligently but not with the expectation of perfection. Ted Pamperin photo

In a prior life as a sailplane (glider) flight instructor, I found too many new pilots and would-be pilots waiting around for the perfect day to go flying. On those days when there was a gusting 30-knot crosswind tumbling over the runway, I understood their qualms. But many of those less-than-ideal days, when the flying was more challenging, offered rewards to those willing to venture out. You can't learn to be a competent pilot in clear weather.

The same lesson applies to model railroading, as my new HO layout reminds me once a month.

Those of you who have read my commentaries for any length of time know that I stand firmly in favor of building model railroads to operate as realistically as they look. There's no reason not to, as it doesn't cost any more. You therefore get more play value for the same investment. It's what gives our "action" hobby an edge over those who build models for static display.

An even better reason to operate your railroad regularly is that it's unquestionably the best

way to find out what's right and what's wrong with it. And, when you know the crew is going to come by soon for your next operating session, you tend to get things done that would otherwise fall to procrastination. It's very easy to seek the comfort of an easy chair in front of the TV instead of trudging into the railroad room to install a few more switch motors or repair a balky locomotive.

We all bring expectations to the table. Your friends expect your railroad to run well. You expect them to enjoy running your railroad, and you want to enjoy it yourself. Zero defects is an understandable (even if unattainable) goal, and the closer we come to it, the happier everyone is.

So we're all agreed, then: Get the railroad and its every component, from locomotives to turnouts, operating perfectly, and then invite the gang over for an operating session. Sounds like a plan.

But that's not a good plan.

Frankly, you won't have the foggiest notion of what perfection really is until you turn your

friends loose on the railroad. In one hour, they'll find problems and come up with questions that you never knew existed!

On the HO scale Nickel Plate railroad that is now operational in my basement, those questions started before the first scheduled train turned a wheel. And the questions have continued to come in as my operating crew and I learn more about how the prototype NKP did things.

There has also been a lot to learn about the new layout itself, including how commercial trackwork components perform under duress, how various models of steam and diesel locomotives succeed or fall down on the job, and what we can do to improve their performance and appearance.

This isn't, after all, a hobby where one should expect to be handed the keys to a new car and drive it for 50,000 miles without thinking about anything except gas and oil. This is a hands-on endeavor – some assembly is most definitely required. In fact, a lot of the satisfaction we derive from a hobby is in learning how to deal with its idiosyncrasies. Pride of ownership isn't about buying perfection, but about approaching it one step at a time.

Waiting until everything is in perfect working order, like a new pilot waiting for perfect weather, is therefore not a plan at all, but rather a form of procrastination. Sure, you want to put on a good show, but I guarantee it'll come up short of your expectations.

So, instead, take a good shot at preparing the railroad to an acceptable degree and then invite the guys and gals over to help you beta-test it. Take a lot of notes and fix the bigger problems. They'll find new problems next time, so there's no sense losing any sleep over it. Just chew away at the bigger bumps, and one day soon you'll find that the railroad operates reasonably well. **MR**

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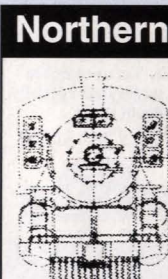


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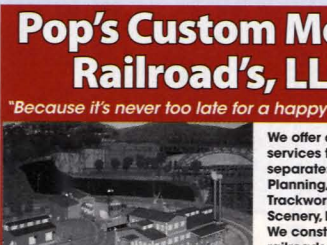
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CLOSING DATES: Jan 2009 issue closes Oct. 17, Feb. closes Nov. 18, Mar. closes Dec. 16, Apr. closes Jan. 16, May closes Feb. 16, June closes Mar. 20, July closes Apr. 17, Aug. closes May 15, Sept. closes June 18, Oct. closes July 17, Nov. closes Aug. 18, Dec. closes Sept. 18.

Note to Readers: Show dates, times and locations sometimes change. Confirm the details before driving any distance. Please go to www.mrrmag.com and click on the **Schedule of Events** section to get more complete information on these and other coming events.

Schedule of Events

AL, BIRMINGHAM: Smoky City Rails Spring Model Train Show/Sale. 1st Baptist Church of Zion City, 1104 Gene Reed Road. Saturday, December 5th, 9am-4pm. \$5.00 adults; 8-12 \$1.00; Under 8 FREE. Handicap Accessible. FREE Parking. Operating Layouts. Door Prizes. Play with trains. Sonny. 205-980-0611 or scrmrrc@aol.com

AZ, MESA; TURKEY MEET November 28-29. Two-day Swap meet at Mesa Convention Center, 201 N Center St., 9am-3pm both Saturday and Sunday. Sales tables, operating layouts, displays. Admission \$6.00 pp, children under 14 free with adult admission. Contact Bob Herman at: 480-948-2730 or visit: www.tcadd.org

AZ, PHOENIX: "IN THE HEAT" SWAP MEET North Phoenix Baptist Church, 5757 N. Central Ave. Saturday, November 7, 2009, 9:00am-1:00pm. Adults \$5.00. All gauges, books, tapes, train railmemorabilia, accessories. Handicap accessible, good food. More information contact David Jerry 602-336-0973 or 602-361-0356. Please leave a message.

CA, SIMI VALLEY: SWAP MEET. Santa Susana Railroad Historical Society, Santa Susana Park, 6503 Katherine Rd. October 31, 2009, 7:00am-10:00am. \$2.00 donation, kids under 12 free. All scales, equipment, scenery, books and photos. For vendor table availability contact Richard 805-526-0371 or e-mail events@santasusanadepot.org

CO, DENVER: ROCKY MOUNTAIN TOY TRAIN SHOW Denver Merchandise Mart, 451 East 58th Ave. November 28-29, 2009, 10:00am-5:00pm both days. Adults \$8.00, kids 12-17 \$4.00, kids under 12 and Scouts in uniform FREE. RMTTS, 7050 South Flower Street, Littleton, CO 80128, 303-364-0274, www.RockyMountainToyTrainShow.com

CT, NORTH HAVEN: NEW HAVEN RAILROAD HISTORICAL AND TECHNICAL ASSOCIATION 47TH ANNUAL REUNION AND TRAIN SHOW. Holiday Inn, Rte. 5, Exit 12 off I-91. Saturday, November 14, 2009. Train show 9:00am-3:00pm. Films, slide shows, modeling clinics, dealers. \$5.00/Adult, \$8.00/Family. Information: Rick Abramson at e-mail: nhr379@att.net

CT, WILLIMANTIC: MODEL TRAIN AND DIE CAST SHOW. Windham High School, 355 High Street. November 15, 2009, 10:00am-3:00pm. Adults \$6.00; Children (8-12) \$1.00; Children (under 8) free. Door prize, handicapped accessible, operating layouts, food on site, free parking. Contact: Joseph Sokol 860-872-2240 or e-mail joseph_sokol@msn.com

FL, FORT MYERS: SCALE RAILS HOLIDAY TRAIN SHOW. ARABA Temple, 2010 Hanson St. Saturday and Sunday, November 28-29, 2009, 10:00am-4:00pm. Adults \$6.00, teens \$2.00, children under 12 free. Sponsored by Scale Rails of SW Florida. Contact Jim Edmier 239-731-0520 or jimedmier@aol.com

FL, OCALA: LIONS SEMI-ANNUAL TRAIN SHOW Ocala National Guard Armory, 900 SW 20th St. November 14-15, 2009, Saturday 9:00am-4:00pm and Sunday 10:00am-3:00pm. Adults \$4.00, children 12 and under free. Information: Barbara West 352-857-2874.

FL, PALMETTO: MANATEE MODEL TRAIN & RAILROAD ARTIFACT SHOW & SALE. Manatee Convention Center. November 14-15, 2009; Saturday 9:00am-4:00pm and Sunday 10:00am-4:00pm. Adults: \$7 (under 12 free). Over 250 tables. Large operating layouts. Altman, PO Box 985, Land O' Lakes, FL 34639. 813-949-7197. E-mail: gse99@aol.com

IL, JOLIET: WILL COUNTY MODEL RAILROAD CLUB ANNUAL SWAP MEET. VFW Hall Post No. 5788, 1026 East 9th Street, Lockport, IL. Sunday, December 6, 2009, 9:00am-3:00pm. Admission \$3.00 per person, children under 12 free. Dealers welcome. Contact Brian 815-730-1785 or e-mail: WillCityModelRR@yahoo.com

IL, ST. CHARLES: 18TH ANNUAL CHICAGO RAILROADIANA SHOW AND SALE. Kane County Fairgrounds, 525 South Randall Road. October 18, 2009, 10:00am-3:00pm. Admission \$5.50+tax. Tables \$55.00. SASE, Russell Fierce, 3565 Winston Drive, Hoffman Estates, IL 60192-1865. Visit www.ChicagoRRShow.com. E-mail: RussFierce@aol.com 847-358-1185

IN, INDIANAPOLIS: THE INDIANAPOLIS MODEL RAILROAD SHOW AND OPEN HOUSE Manual High School Gymnasium, Saturday, December 12th, 2009, 10:00am-3:00pm. Admission \$5.00, children 12 & under free. Boy Scouts in uniform Free. Naptown & White River Model Railroad Club. Contact: Steven Handly, 317-786-8627, Website: <http://www.naptownrr.org>

IN, MICHIGAN CITY: DUNELAND MODEL RR CLUB TRAIN SHOW AND SWAP MEET, IBEW Building, 301 East 8th St. Sunday, November 29, 2009, 10:00am-3:00pm (Chicago time). Adults \$3.00, youths 6-13 \$1.00, 5 and under free. Contact: Don Nagdeman 219-879-1196, dmcrcman@sbcglobal.net or Matt Bim-Merle 219-872-5157, mlwkrd@gmail.com

MA, HINGHAM: SOUTH SHORE MODEL RAILWAY CLUB FALL OPEN HOUSE/SHOW. Bare Cove Park, Building 51, 19 Fort Hill Street. October 24-25, 2009, Saturday 9:00am-4:00pm; Sunday 10:00am-4:00pm. White elephant table, clinics, rail movies, raffle and club cars for sale. Jack Foley, www.ssmrc.org 781-740-2000, E-mail ssmrc@verizon.net

MA, MARLBOROUGH: HUB DIVISION NER/NMRA. Royal Plaza Trade Center, 181 Boston Post Road West (Rte. 20). Saturday, December 5, 2009, 10:00am-5:00pm; Sunday, December 6, 2009, 10:00am-4:00pm. Adults \$7.00, Seniors (60+) \$6.00, Under 12/Scouts in uniform FREE. Information: Jerry 339-788-0967; Mark 508-528-8587; e-mail info@hubdiv.org; website: www.hubdiv.org

MD, GAITHERSBURG: 4TH ANNUAL GAITHERSBURG MODEL TRAIN SHOW. Montgomery County Fairgrounds, Old Auditorium. November 1, 2009, 9am to 4pm. Adults: \$7 (under 12 free). Over 100 tables. Large operating layout. Miller, 3106 N Rochester St, Arlington, VA 22213. 703-536-2954 E-mail: rrshows@aol.com

ME, BREWER: EASTERN MAIN MODEL RAILROADER CLUB SHOW Geoff's Catering, 15 Littlefield Way. Saturday, November 21, 2009, 10:00am-3:30pm. Admission \$4.00 for adults, under 12 free. Dealers, silent auction and operating layouts. Geoff Anthony, PO Box 187, Blue Hill, ME 04614, 207-374-2786, dahak@roadrunner.com

MI, EAST LANSING: LANSING MODEL RAILROAD CLUB SHOW AND SALE. Michigan State University Pavilion. Sunday, November 22, 2009, 10:00am-4:00pm. Adults \$6.00, children under 12 free. Mid-Michigan's largest show w/over 450 tables. Show flyer, forms and map www.lmrc.org or call Ron St. Laurent 517-347-1831.

MI, KALAMAZOO: KALAMAZOO TRAIN SHOW AND SALE. Kalamazoo County Fair Grounds, Hazel Grey Building. October 25, 2009, 10:00am-3:30pm. Admission \$5.00, children 10 and under free. Operating layouts all scales, concession stand, door prizes. Sponsored by: Kalamazoo Model Railroad Historical Society. Check www.kmrhs.org free clinics updates.

MI, ORCHARD LAKE: ST. MARY'S TRAIN SHOW St. Mary's Athletic Complex. 3535 Indian Trail. Sunday, December 6, 2009, 10:00am-4:00pm. Adults \$5.00, 12 and under free. Operating layouts. For more info call Rob Goddard, 248-683-0545.

MI, DETROIT AREA'S PREMIER ONE-DAY TRAIN SHOW & SALE. First Sunday in March and November. Presented by GRATIOT VALLEY RAILROAD CLUB. Adults \$5.50, under 12 free. 10am to 4pm. Layouts, clinics, door prizes, 400+ vendor tables. Details at www.gvrr.org or call 586-468-4877.

NH, BEDFORD: 27TH ANNUAL BEDFORD BOOMERS MODEL RAILROAD EXHIBITION McKelvie Middle School, 108 Liberty Hill Road. Sunday, November 8, 2009, 10:00am-4:00pm. Donations only. No dealers. Contact: Norm Jones at 978-687-0780. Website: www.boomers-rr.com

NH, LITTLETON: AVRA 32ND ANNUAL FALL ALL SCALE MODEL RAILROAD SHOW. Profile School, Profile Road, Bethlehem, NH. October 31, 2009, 10:00am-3:00pm. Adults 16 \$3.00, students and children free. Profile Road is east of the junction of US 302 & I-93 exit 40. Bill Driscoll, 603-747-3492.

NJ, MAGNOLIA: 2ND ANNUAL MODEL TRAIN SHOW Community Hall, Albertson & Brook Ave. Saturday, November 21, 2009, 9:00am-3:00pm. Adults \$5.00, 11-18 \$3.00, children free. Food, drink, door prizes. Free parking. Information Mert Gardner 856-784-8251.

NY, ALBANY: ANNUAL "GREAT TRAIN EXTRAVAGANZA" 2009 Empire State Convention Center. Sunday, December 6th. 10am-4pm. \$5 adults, children free. Operating layouts. 200+ tables of model trains, train sets, parts, accessories, scenery items, books, videos, DVDs, prints, railroad memorabilia. Educational displays. Seminars. www.gtealbany.org 518-371-9164.

OH, DALTON: CJ TRAINS FALL GREATER WAYNE COUNTY TRAIN AND TOY SHOW Buckeye Event Center, 624 Henry St. Sunday, November 8, 2009, 10:00am-4:00pm. \$5.00 admission, 12 and under free. \$25.00 dealer table. Jon Ulbright, 941 Buchholz Drive, Wooster, OH 44691, 330-262-7488. cathijon@ssnnet.com www.cjtrains.com

OH, HILLIARD (COLUMBUS): TOY TRAIN OPERATING SOCIETY CHRISTMAS TRAIN SHOW. Franklin County Fairgrounds, Edwards & Ganyard Bldgs., December 13, 2009, 11:00am-4:00pm. \$8.00 family, \$3.00 adults, under 12 free, member tables \$6.00, others \$15.00. Robert Weimer 614-478-8184. 292 Wildwood Ct, Gahanna, OH 43230, RNMWWEIMER@wowway.com

OH, MILAN: NORWALK & WESTERN MODEL RR CLUB TRAIN & TOY SHOW. Ehoove Career Center, 316 W. Mason Rd. (1/4 mile north of Ohio Turnpike Exit 118). November 15th, 2009, 10:00am-3:00pm. Admission: 12 and over \$3.00. Contact Tony Catalano, PO Box 938, Norwalk, OH 44857-0938, 419-499-4856.

OH, OLMSTED FALLS: CUYAHOGA VALLEY & WEST SHORE MODEL RAILROAD CLUB ANNUAL CHRISTMAS OPEN HOUSE The Olmsted Falls Depot, 25802 Garfield Blvd. December 5-6, 2009, 12:00noon-5:00pm. Admission: \$2.00, kids free! Lionel, HO and N scale layouts. Information: Bill Cramer 440-572-3714, wmrcramer@yahoo.com

PA, GLENSIDE: 6TH ANNUAL TOYS FOR TOTS TRAIN SHOW. North Penn VFW Post 676, 2519 Jenkintown Rd. Saturday, November 21, 2009, 9:00am-2:00pm. Adults \$3.00, kids under 12 free. Sponsored by The Marine Corps League #1023. N scale train layout raffle \$5.00 per ticket. Information- Mark Carver 215-264-2869.

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PA, HORSHAM: MAIN STREET TRAIN SHOW Keith Valley Middle School, 227 Meetinghouse Rd. Saturday, December 5, 2009, 10:00-4:00pm. \$5.00 adults, under 12 free. Al Wipplinger 215-672-7390, villagehdw@aol.com

PA, MONACA: BEAVER COUNTY MODEL RR FALL TRAIN SHOW & SALE. Center Stage, 1495 Old Brodhead Road. Sunday, November 22nd, 2009, 10:00am-3:00pm. Adults \$4.00, under 12 free. Sponsored by Beaver County Model RR & Historical Society. Contact: Glenn Wallace 724-775-8023 or www.bcmrr.railfan.net or info@bcmrr.railfan.net

SC, NORTH CHARLESTON: 11TH ANNUAL BEST FRIEND OF CHARLESTON TRAIN SHOW. Sponsored by: Charleston Railroad Historical Society. November 14-15th. 5000 Lackawanna Blvd. Saturday and Sunday 10-4pm. Admission: \$5, children under 10 free with adult. Operating layouts, tables available. Contact: Mary Lehr: 843-768-0691 e-mail: BestFriendModelTrainShow@yahoo.com; www.BestFriendofCharleston.org/ModelTrainShow.html

VA, VIENNA: NORTHERN VIRGINIA MODEL RAILROADERS OPEN HOUSE. W&OD Depot, 231 Dominion Rd. (along bike trail), Saturday, November 14th and Saturday, December 12th, 1:00pm-5:00pm. Monday, November 30th, 6:00pm-9:00pm. Admission free (donations accepted). nvmrinc@yahoo.com www.nvmr.org

VA, WINCHESTER: WINCHESTER MODEL RAILROAD CLUB TRAIN SHOW AND SALE. Friendship Fire Hall, North Pleasant Valley Road. Saturday, November 14, 2009, 9:00am-2:00pm. Adults \$4.00 (\$3.00 with Post Card), children 12 and under free with adult. Club layout, 430 N. Cameron St., open during show. Info: 540-665-9898, www.wmrrc.org

WA, KENT: BOEING EMPLOYEES MODEL RAILROAD CLUB ANNUAL SWAP MEET Kent Commons, 525 - 4th Avenue North. November 14, 2009, 9:30am-4:00pm. \$6.00 adults, children 14 and under free. Ed Sherry, 550 SW Colewood Lane, Normandy Park, WA 98166; 206-244-3884; swapmeet@bemrrc.com

CANADA, ON, WHITBY: PINE RIDGE RAILROADERS SHOW. 1020 Dryden Blvd. Father Leo J. Austin School near Anderson Street. November 21-22, 2009. Saturday 10-4:30pm, Sunday 10-4pm. Admission: Adults \$5, under 14 \$2, under 5 FREE. Multi-scale layouts & displays, vendors and videos. For more information: www.trainweb.org/prrc

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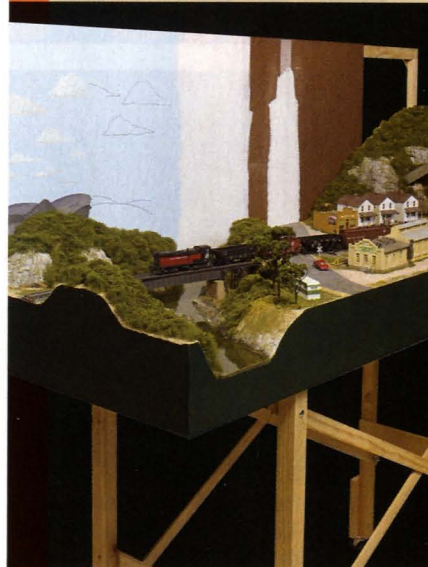
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Running as Extra 1954 East, a Louisville & Nashville coal train known as the Loyall Turn blasts through Grays, Ky., in 1954. The M-1 2-8-4 carries white flags to identify the train as an extra. Philip R. Hastings photo

Running extra trains

An **extra train** is defined in railroad rule books as a train without a timetable schedule. Railroads use extra trains in a variety of ways, and we can do the same in our model railroad operations.

On railroads that scheduled most or many of their trains in the timetable, an extra might be exactly what its name seemed to imply: an additional train needed for traffic that can't be accommodated on the scheduled trains. Other railroads ran most or all of their freight trains as extras.

Even when all freights run extra, at least some of the extra trains might be regular services with schedules published to attract shippers. Others could be trains operated regularly with set duties known to dispatchers, yardmasters, and train crews – the train shown in the photo is one of these. Still other extras operated as needed for temporary increases in business or other occasional purposes, including special passenger trains.

Whatever the reason for operating extra trains, since they aren't scheduled in the timetable, they must operate under other authority.

Kinds of authority. Under classic timetable-and-train-order rules, extras are authorized by Form G train orders in the format "Engine (number) run extra (initial station)

to (terminal station)." That gives the train headed by that locomotive authority to occupy the main track for the purpose of running from the first-named station to the second.

The extra's formal identity comes from its engine number and direction. It may be known as the "Green Fruit Express" or the "Loyall Turn," but in train orders and other records it's "Extra (engine number) (timetable direction)," such as "Extra 145 East."

Where signal indications conferred movement authority, such as two or more main tracks with a current of traffic and automatic block signals, or under Centralized Traffic Control (CTC), timetable instructions could allow extra trains to be authorized by a numbered and okayed clearance card instead of a Form G train order.

Today the term "extra" is no longer used, but neither are timetable schedules. In effect all trains operate as extras, authorized by track warrant and governed by additional warrants or by automatic or CTC signals. The engine number is used as the train's formal identification, and track warrants are addressed to the engine rather than to a train symbol or name.

Over the road. In terms of superiority of trains, extras are inferior to all regular trains (all trains with

timetable schedules). The conductor and engineer of an extra are responsible for clearing the schedules of opposing superior trains, and of first class trains in the same direction. "Clearing the schedule" means getting off the main line into a passing siding or other track at least five minutes before the scheduled time of the superior train.

The dispatcher may modify the extra train's superiority by train order, and often will issue orders to help an extra progress against a late-running superior train. On single track, the dispatcher is also responsible for issuing orders to protect opposing extras from each other, since the crew of an extra train can't know where an opposing extra might be.

Forms of train-order protection against opposing extras include:

- Form S-A meet orders, specifying where opposing extras will meet.
- Form S-C right orders, giving one extra superiority, "right," over another to a particular station.
- Form E time orders, giving one extra a schedule opposing extras can run against as if it were a timetable schedule.

(These forms of orders were also used to help extra trains against opposing regular trains, or to modify the schedules of regular trains.)

When extra trains meet, the train in the inferior timetable direction takes the siding unless otherwise directed by train order. Note, however, that this doesn't mean extras in the superior direction have any superiority not given in a train order.

Extra trains can offer interesting variety in train movements, and for certain prototypes can be the majority of all trains. By understanding how and why they run, you can make them an important and realistic element of your railroad's operations too. **MR**

More on our Web site

Learn how to identify extra trains with classification signals at www.ModelRailroader.com.

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